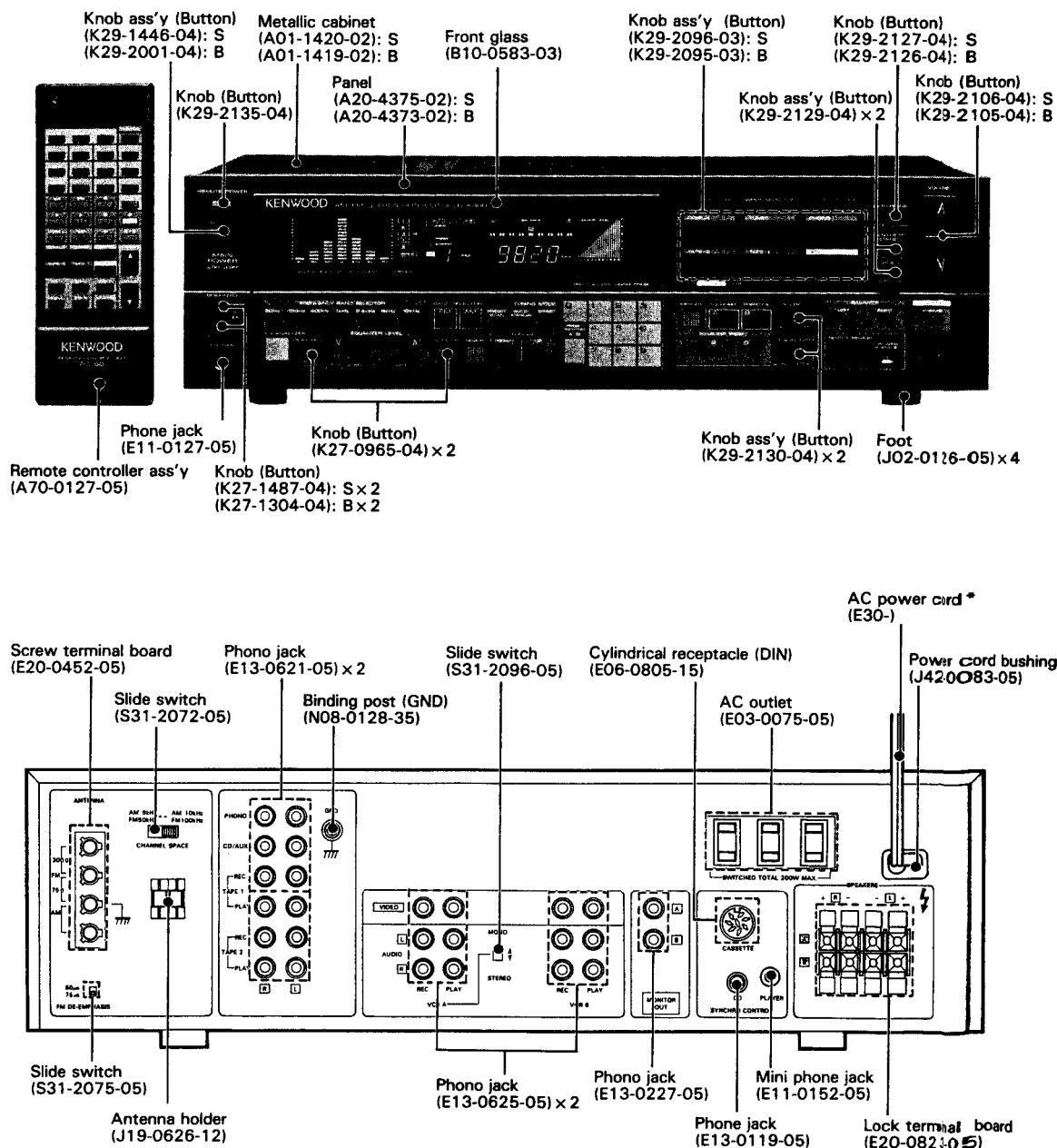


# KENWOOD KVR-A90R

## AM-FM STEREO RECEIVER

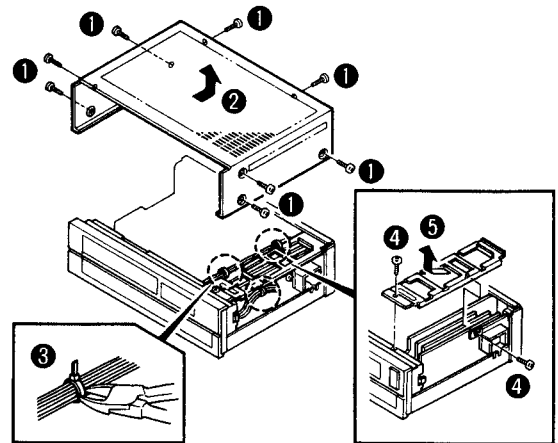


**Note:**  
For circuit descriptions, refer to the  
KVR-A70R service manual.

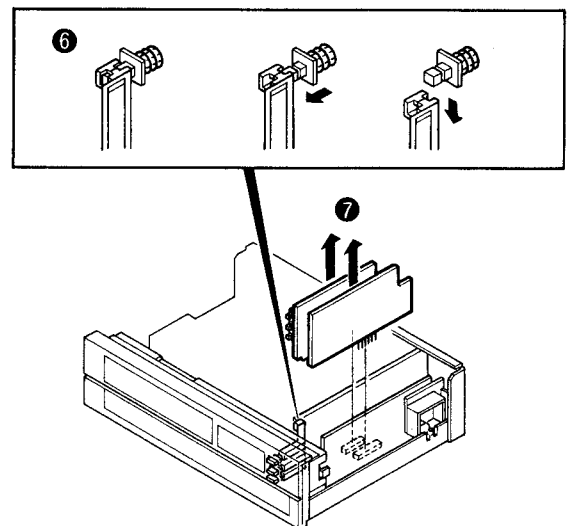
\* Refer to parts list on page 16.  
Photo is KVR-A90R (Black version).  
S: Silver version  
B: Black version.

## DISASSEMBLY FOR REPAIR

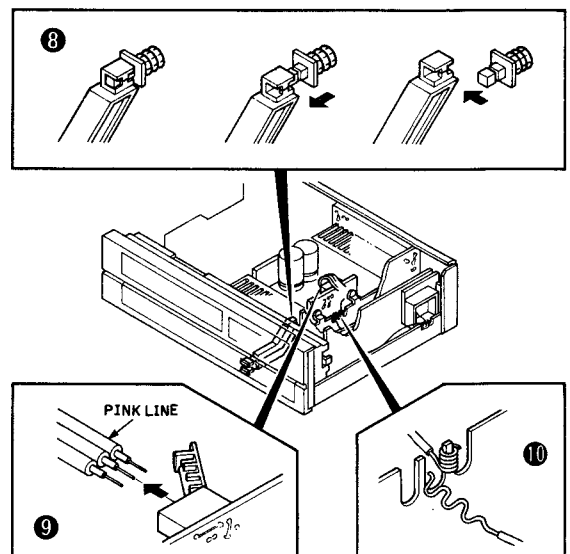
1. Remove 8 screws and remove the metallic cabinet (1, 2).
2. Cut the wire bands (3).
3. Remove 1 screw retaining the frame to the sub panel and 1 screw at the side (4).  
Slide out the frame as shown by the arrow (5).



4. Take the knob joints from the CARTRIDGE, SYNTHETIC STEREO, VIDEO switches by the following procedures (6).
  - a. Pull out the knob joint frontward till it stops.
  - b. Slide the knob joint downward so that the switch shaft can be relieved from the cut part of the knob joint.
5. Pull out the video control pcb (X14-1790-10) (A/2) and receiver pcb (X14-1780-10) (D/5) (7).

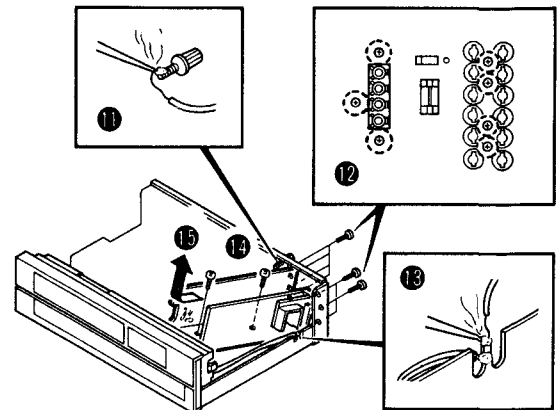


6. Take the knob joints from the EQ REC, EQUALIZER switches by the following procedures (8).
  - a. Pull out the knob joint frontward till it stops.
  - b. Slide the knob joint leftward so that the switch shaft can be relieved from the cut part of the knob joint.
7. Disconnect the parallel cord from receiver pcb (X14-1780-10) (A/5) to power amp pcb (X07-2220-10) (B/6) (9).
8. Unwrap the ground lead from the receiver pcb (X14-1780-10) (A/5) (10).

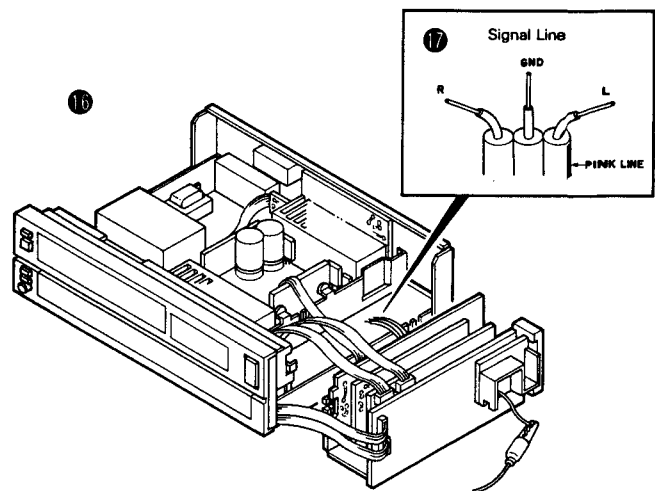


## DISASSEMBLY FOR REPAIR

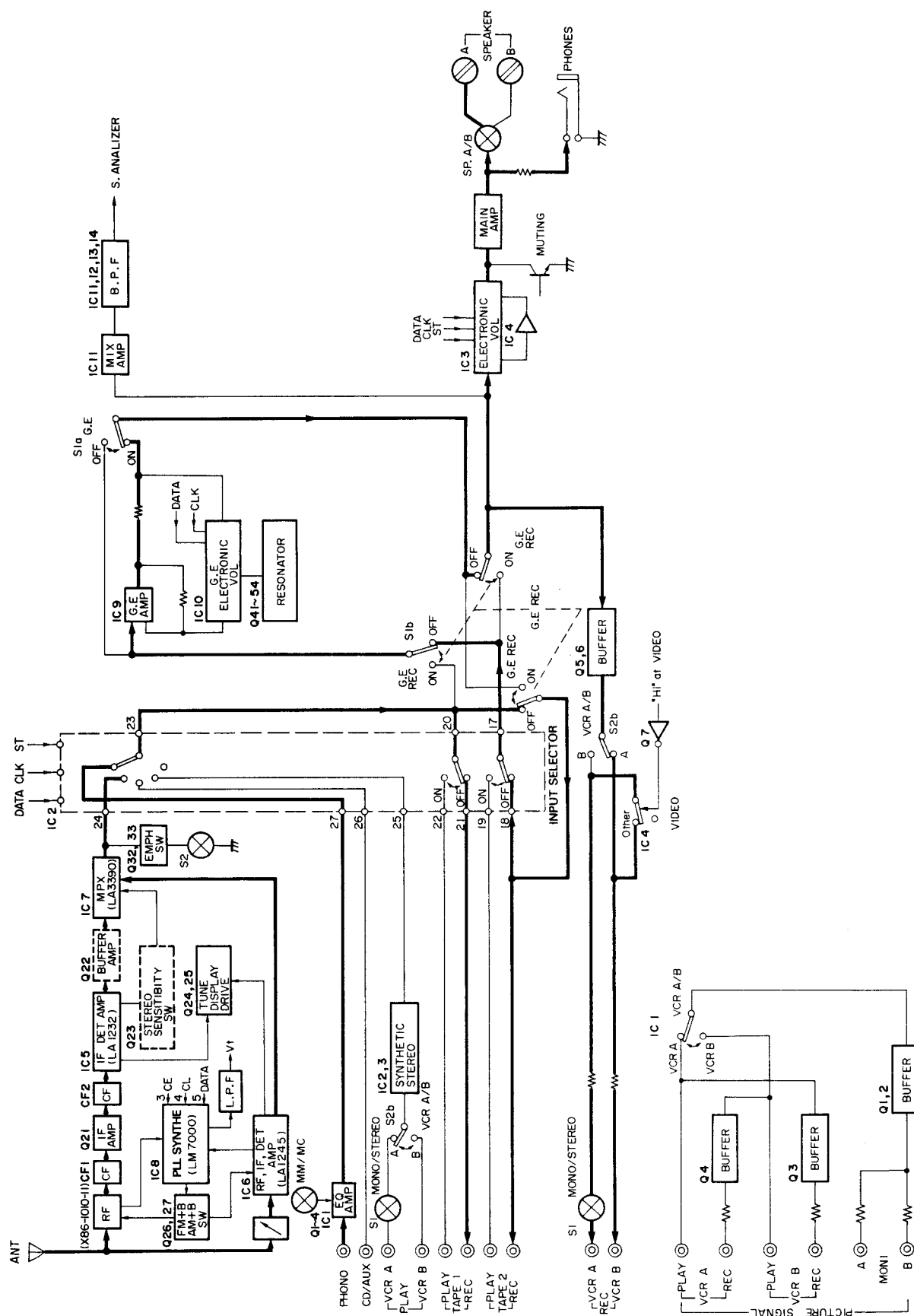
9. Unsolder the ground lead to the GND terminal ( 11 ).
10. Remove 7 screws retaining the antenna terminal and phono jacks ( 12 ).
11. Unsolder the ground lead from receiver pcb (X14-1780-10) (C/5) ( 13 ).
12. Remove 2 screws retaining the receiver pcb (X14-1780-10) (B/5) ( 14 ). This receiver pcb will be called mother pcb hereinafter.
13. Lift the front side of the mother pcb and take it out to the side ( 15 ).



14. Plug in the video control pcb (X14-1790-10) (A/2) and receiver pcb (X14-1780-10) (D/5), once taken out in step 5, back to the mother pcb ( 16 ).
15. The KVR-A90R can be checked at this condition by grounding the ground leads which were taken off from the chassis.  
The parallel cords disconnected in step 7 is a signal line to the power amp pcb ( 17 ).



## BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

**Power amplifier unit (X07-2220-10)**

Components	Functions	Operations
Q1 - Q16	Main amp, voltage amp	
Q17 - Q20	Bias, temperature compensation	
Q21 - Q24	Driver stage	
Q25 - Q28	Final stage	
Q29, Q30, Q33	4 $\Omega$ limiter circuit	
Q31, Q32	Overload detection	
Q34 - Q49	Constant-voltage power regulation and timing circuitry	
Q50 - Q52	Power supply relay drive circuit	
IC1	Output relay drive, protection	
IC2	Remote control pre-amp	

**Display unit (X14-1770-10)**

Components	Functions	Operations
IC1 ( $\mu$ PD7519G-172-36)	Display, control	
IC2 (LC7565)	Graphic equalizer display	
IC3, IC4 ( $\mu$ PD4028BC)	Decoder of 4 to 10	
Q1 - Q3 (2SA933)	Switching circuit	
Q4 (2SC1845)	Volume control circuit	Outputs control signal for muting when the volume is minimum.
Q5 - Q9 (2SC945)	Current buffer	
Q10 - Q17 (2SC945)	STROBE/DATA/CLK control	Differentiates the STROBE signal and transmits the DATA and CLK signals using the differentiated signal.
Q18 (2SC945)	Tuner control	

**Receiver unit (X14-1780-10)**

Components	Functions	Operations
Q1 - Q4	EQ amp 1st stage	
Q5, Q6	Muting transistors	ON when a selector switch (except TAPE-2) is operated or when the volume is set to $-\infty$ .
Q7	Muting transistor driver	
Q21	IF amplifier	
Q22	Buffer	
Q24	Tuning display drive	Q24 OFF during tuning.
Q26, Q27	AM + B/FM + B switching	Q26: FM + B, Q27: AM + B
Q28, Q29	Synthesizer LPF	
Q30	Ripple filter	
Q31	+5 V AVR	
Q32, Q33	Emphasis switching transistors (U type)	Transistor ON at 75 $\mu$ s
Q41 - Q54	Semiconductor inductor	
Q55	Level shifting	

## CIRCUIT DESCRIPTION

Components	Functions	Operations
Q56	Constant-voltage regulated power supply (7 V)	
IC1	EQ amplifier	
IC2	Input selector application	Analog switch
IC3	Electronic volume	
IC4	Buffer amplifier	
IC5	FM IF detection	
IC6	AM	
IC7	MPX	
IC8	PLL synthesizer	
IC9	Graphic equalizer amplifier	
IC10	Graphic equalizer electronic volume	
IC11 (1/2)	MIX amplifier	
(2/2)	Band-pass amplifier	
IC12 - IC14	Band-pass amplifier	

### Video control unit (X14-1790-11)

Components	Functions	Operations
Q1 - Q4	Video signal buffer	
Q5, Q6	Audio buffer	
Q7	Level shifting and inversion	
IC1	Video signal switching	
IC2, IC3	Synthetic stereo	
IC4	Audio REC switching circuit	Switches between 1 - 2 and 10 - 11: Open in VIDEO mode, Short-circuited in modes other than VIDEO.

# ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
<b>FM SECTION</b> Unless otherwise specified, the individual switches should be set as following: SELECTOR: FM MODE: AUTO							
1	BAND EDGE (1)	—	Connect a DC voltmeter between TP8 and TP9.	87.5MHz	(X86-101) L8	2.5V	(a)
2	BAND EDGE (2)	—	Connect a DC voltmeter between TP8 and TP9.	103MHz	(X86-101) TC1	8.0V	(a)
Repeat alignments 1 and 2 several times.							
3	RF ALIGNMENT	(A) 98.0MHz 1kHz, ±75kHz dev	(B)	MODE: MONO 98.0MHz	(X86-101) L2,4 (L5)	Maximum amplitude and symmetry of the oscilloscope display.	
4	DISCRIMINATOR (1)	(A) 98.0MHz 1kHz, ±75kHz dev 60dB (ANT input)	Connect a DC voltmeter between TP11 and TP12.	MODE: MONO 98.0MHz	(X14-178) T1	0V	(b)
5	DISCRIMINATOR (2)	(A) 98.0MHz 1kHz, ±75kHz dev 60dB (ANT input)	(B)	MODE: MONO 98.0MHz	(X14-178) T2	Minimum distortion.	
6	VCO	(A) 98.0MHz 0 dev 60dB (ANT input)	Connect a 330kΩ resistor to TP13. Connect a frequency counter to the resistor via an AC voltmeter.	98.0MHz	(X14-178) VR2	76.00kHz	(c)
7	DISTORTION (STEREO)	(C) 98.0MHz 1kHz, ±68.25kHz dev Selector: L or R Pilot: ±6.75kHz dev 60dB (ANT input)	(B)	98.0MHz	(X86-101) L7	Minimum distortion.	
8	SEPARATION (E type)	(C) 98.0MHz 1kHz, ±40kHz dev Selector: L or R Pilot: 6kHz dev 60dB (ANT input)	(B)	98.0MHz	(X14-178) VR3	Minimum crosstalk.	
<b>AM SECTION</b> Keep the AM loop antenna installed. SELECTOR: AM							
(1)	BAND EDGE (1)	—	Connect a DC voltmeter between TP8 and TP9.	530kHz (531kHz)	(X14-178) L4	1.5V	(a)
(2)	BAND EDGE (2)	—	Connect a DC voltmeter between TP8 and TP9.	1610kHz (1602kHz)	(X14-178) TC2	8.0V	(a)
Repeat alignments (1) and (2) several times.							
(3)	RF ALIGNMENT (1)	(D) 600kHz 400Hz, 30% mod	(B)	600kHz	(X14-178) L5	Maximum amplitude and symmetry of the oscilloscope display.	
(4)	RF ALIGNMENT (2)	(D) 1400kHz 400Hz, 30% mod	(B)	1400kHz	(X14-178) TC1	Maximum amplitude and symmetry of the oscilloscope display.	
Repeat alignments (3) and (4) several times.							
<b>AUDIO SECTION</b>							
①	IDLE CURRENT	—	Connect a DC voltmeter across CP1 (CP2).	VOLUME: ∞	(X07-222) VR1 (L) VR2 (R)	18mV	(e)
②	SPECTRUM ANALYZER	(E) 1kHz, 5mV	FIP INDICATOR	SELECTOR: CD VOLUME: ∞ EQ: DEFEAT	(X14-178) VR1	1kHz, 0.01W	(f)

# REGLAGES

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DU TUNER	POINT DE L'ALIGNEMENT	ALIGNER POUR	FIG.
SECTION MF							
Sauf en cas d'indications spéciales, régler chaque commutateur comme suit: SELECTEUR: FM MODE: AUTO							
1	BORD DE BANDE (1)	—	Connecter un voltmètre CC entre les TP8 et TP9.	87,5MHz	(X86-101) L8	2,5V	(a)
2	BORD DE BANDE (2)	—	Connecter un voltmètre CC entre les TP8 et TP9.	108MHz	(X86-101) TC1	8,0V	(a)
Répéter les points 1 et 2 plusieurs fois.							
3	ALIGNEMENT HT	(A) 98,0MHz 1kHz, ±75kHz dév	(B)	MODE: MONO 98,0MHz	(X86-101) L2,4 (L5)	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
4	DISCRIMINATEUR (1)	(A) 98,0MHz 1kHz, ±75kHz dév 60dB(Entrée ANT)	Connecter un voltmètre CC entre les TP11 et TP12.	MODE: MONO 98,0MHz	(X14-178) T1	0 V	(b)
5	DISCRIMINATEUR (2)	(A) 98,0MHz 1kHz, ±75kHz dév 60dB(Entrée ANT)	(B)	MODE: MONO 98,0MHz	(X14-178) T2	Distorsion minimale.	
6	VCO	(A) 98,0MHz 0 dév 60dB(Entrée ANT)	Connecter une résistance de 330kΩ à TP13. Raccorder un compteur de fréquence à une résistance par l'intermédiaire d'un voltmètre CA.	98,0MHz	(X14-178) VR2	76,00kHz	(c)
7	DISTORSION (STEREO)	(C) 98,0MHz 1kHz, ±68,25kHz dév Selection: C ou D Signal pilote: ±6,75kHz dév 60dB(Entrée ANT)	(B)	98,0MHz	(X86-101) L7	Distorsion minimale.	
8	SEPARATION (E type)	(C) 98,0MHz 1kHz, ±40kHz dév Selection: C ou D Signal pilote: ±6kHz dév 60dB(Entrée ANT)	(B)	98,0MHz	(X14-178) VR3	Diaphone minimale.	
SECTION MA							
Laisser l'antenne bouche MA installée. SELECTEUR: AM							
(1)	BORD DE BANDE	—	Connecter un voltmètre CC entre les TP72 et TP73.	530kHz (531kHz)	(X14-178) L4	1,5V	(a)
(2)	BORD DE BANDE	—	Connecter un voltmètre CC entre les TP72 et TP73.	1610kHz (1602kHz)	(X14-178) TC2	8,0V	(a)
Répéter les points (1) et (2) plusieurs fois.							
(3)	ALIGNEMENT HT (1)	(D) 600kHz 400Hz, 30% mod	(B)	600kHz	(X14-178) L5	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
(4)	ALIGNEMENT HT (2)	(D) 1400kHz 400Hz, 30% mod	(B)	1400kHz	(X14-178) TC1	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
Répéter les points (3) et (4) plusieurs fois.							
SECTION AUDIO							
①	REGLAGE DU COURANT DE POLARISATION	—	Connecter un voltmètre CC sur CP1 (CP2).	VOLUME: -∞	(X07-222) VR1 (G) VR2 (D)	18mV	(e)
②	SPECTRUM ANALYZER	(E) 1kHz, 8mV	INDICATEUR FIP	SELECTEUR: CD VOLUME: -∞ EQ: DEFEAT	(X14-178) VR1	1kHz, 0,01W	(f)



# ABGLEICH

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	TUNER-EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
UKW-EMPFANGSABTEILUNG    Außer wenn anders angegeben, die verschiedenen Schalter wie folgt einstellen: SELECTOR: FM    MODE: AUTO							
1	BANDKANTE (1)	—	Einen Gleichspannungsmesser zwischen TP8 und TP9 anschließen.	87,5MHz	(X86-101) L8	2,5V	(a)
2	BANDKANTE (2)	—	Einen Gleichspannungsmesser zwischen TP8 und TP9 anschließen.	108MHz	(X86-101) TC1	8,0V	(a)
Abstimmungen 1 und 2 mehrere Male wiederholen.							
3	EMPFANGS-BEREICH-ABSTIMMUNGEN	(A) 98,0MHz 1kHz, ±75kHz Hub	(B)	MODE: MONO 98,0MHz	(X86-101) L2.4 (L5)	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
4	DISKRIMINATOR (1)	(A) 98,0MHz 1kHz, ±75kHz Hub 60dB(ANT-Eingang)	Einen Gleichspannungsmesser zwischen TP11 und TP12 anschließen.	MODE: MONO 98,0MHz	(X14-178) T1	0 V	(b)
5	DISCRIMINATOR (2)	(A) 98,0MHz 1kHz, ±75kHz Hub 60dB(ANT-Eingang)	(B)	MODE: MONO 98,0MHz	(X14-178) T2	Minimaler Klirrfaktor.	
6	SPANNUNGS-GEREGELTER OSZILLATOR	(A) 98,0MHz 0 Hub 60dB(ANT-Eingang)	Einen 330kΩ Widerstand zu TP13 anschließen. Einen Frequenzzähler über einen Wechselspannungsmesser an den Widerstand anschließen.	98,0MHz	(X14-178) VR2	76,00kHz	(c)
7	KLIRRFAKTOR (STEREO)	(C) 98,0MHz 1kHz, ±68,25kHz Hub Wähler: L oder R Piloten: ±6,75kHz Hub 60dB(ANT-Eingang)	(B)	98,0MHz	(X86-101) L7	Minimaler Klirrfaktor.	
8	STEREO KANAL TRENNUNG (E type)	(C) 98,0MHz 1kHz, ±40kHz Hub Wähler: L oder R Piloten: ±6kHz Hub 60dB(ANT-Eingang)	(B)	98,0MHz	(X14-178) VR3	Minimales Übersprechen.	
MW-EMPFANGSABTEILUNG    Die MW-Rahmenantenne angebracht lassen.    SELECTOR: AM							
(1)	BANDKANTE (1)	—	Einen Gleichspannungsmesser zwischen TP8 und TP9 anschließen.	530kHz (531kHz)	(X14-178) L4	1,5V	(a)
(2)	BANDKANTE (2)	—	Einen Gleichspannungsmesser zwischen TP72 und TP73 anschließen.	1610kHz (1602kHz)	(X14-178) TC2	8,0V	(a)
Abstimmungen (1) und (2) mehrere Male wiederholen.							
(3)	HF-ABGLEICH (1)	(D) 600kHz 400Hz, 30% mod	(B)	600kHz	(X14-178) L5	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
(4)	HF-ABGLEICH (2)	(D) 1400kHz 400Hz, 30% mod	(B)	1400kHz	(X14-178) TC1	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
Abstimmungen (3) und (4) mehrere Male wiederholen.							
AUDIO-EMPFANGSABTEILUNG							
①	LEERLAUFSTROM	—	Einen Gleichspannungsmesser über CP1(CP2) anschließen.	VOLUME: -∞	(X07-222) VR1 (L) VR2 (R)	18mV	(e)
②	SPECTRUM ANALYZER	(E) 1kHz, 8mV	FIP INDIKATOR	SELECTOR: CD VOLUME: -∞ EQ: DEFEAT	(X14-178) VR1	1kHz, 0,01W	(f)

## ADJUSTMENT/REGLAGES/ABGLEICH

### TEST INSTRUMENT

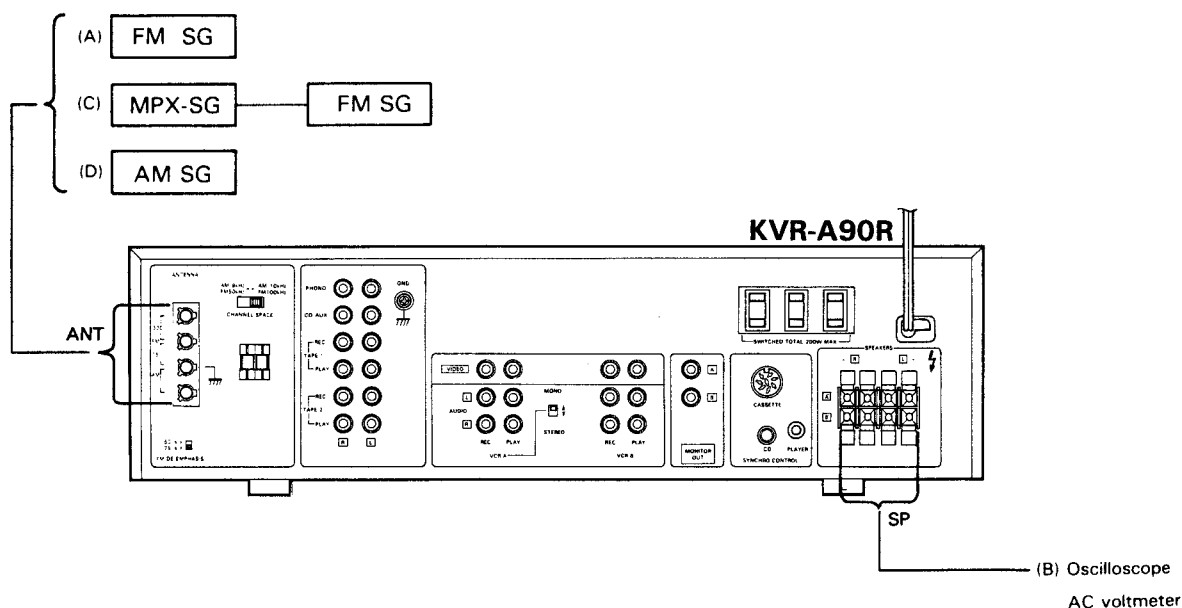
Oscilloscope .....  
 AM signal generator.....  
 FM signal generator.....  
 SDK signal generator.....  
 Audio generator.....  
 AC voltmeter.....  
 FM multiplex generator.....  
 Frequency counter.....  
 DC voltmeter.....  
 Distortion meter.....  
 Dummy antenna.....

### APPAREILLAGE

Oscilloscope .....  
 Générateur MA .....  
 Générateur MF .....  
 Générateur SDK.....  
 Générateur audio fréquences.....  
 Générateur multiplex stéréo.....  
 Fréquence-mètre.....  
 Voltmètre CC.....  
 Distorsiomètre.....  
 Antenne fictive.....

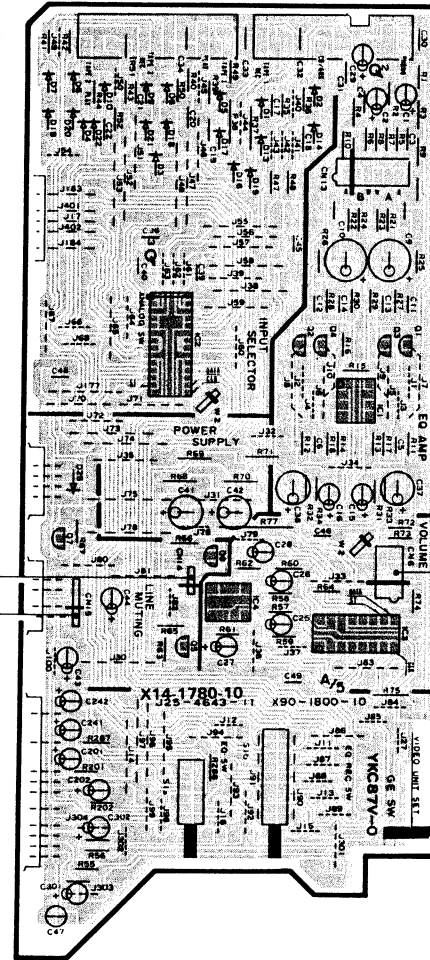
### PRÜFINSTRUMENTE

Osilloskop ..... SCOPE  
 MW-Signalgenerator ..... AM-SG  
 UKW-Signalgenerator ..... FM-SG  
 SDK-Signalgenerator ..... SDK-SG  
 NF-Signalgenerator ..... AG  
 Wechselspannungsmesser .....  
 UKW-Multiplexgenerator ..... FM-MPX  
 Frequenzzähler .....  
 Gleichspannungsmesser .....  
 Klirrfaktormesser .....  
 Antennennachbildung .....

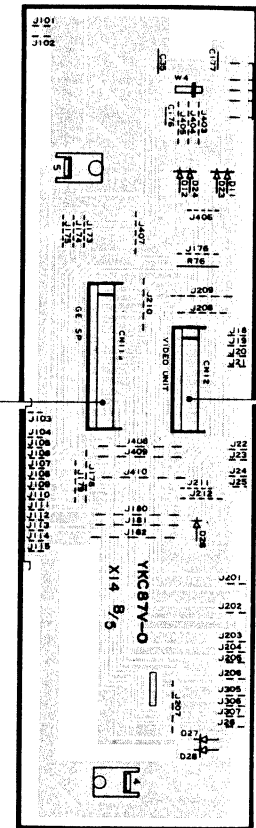
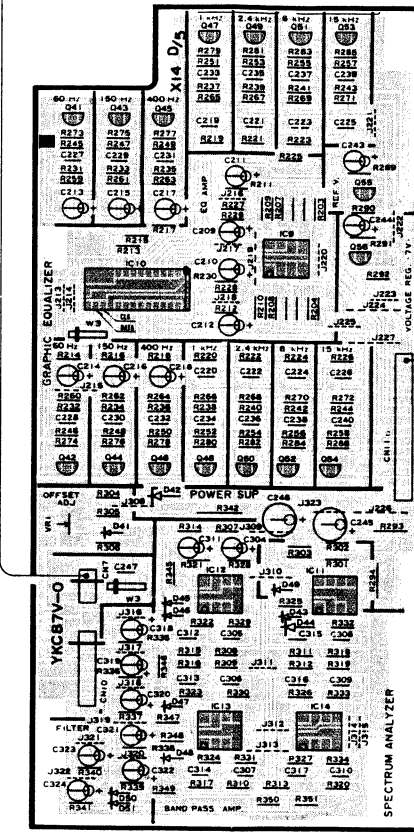
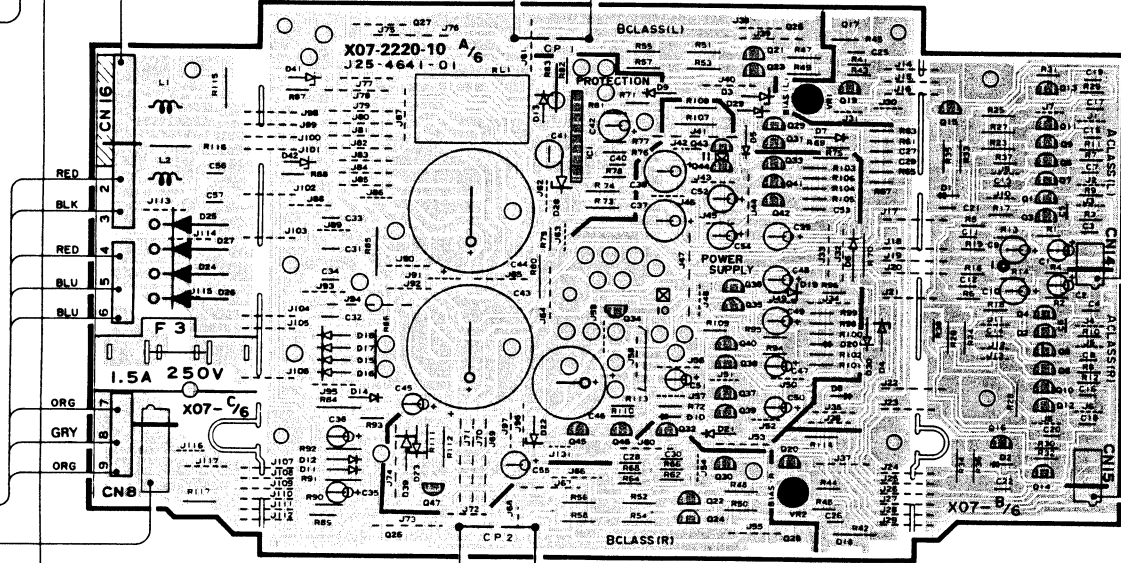


## PC BOARD

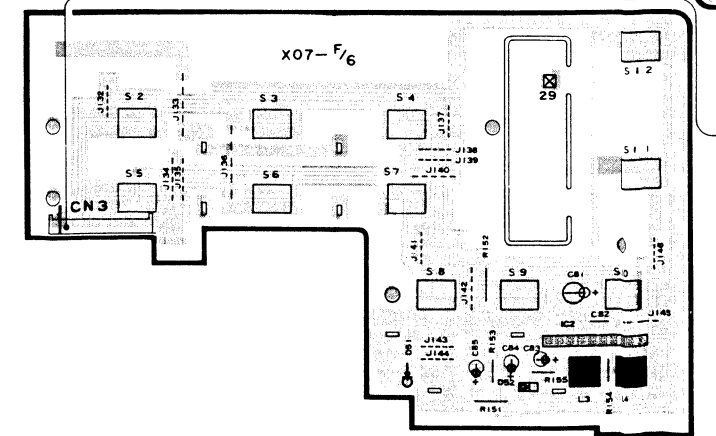
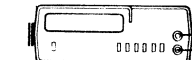
RECEIVER UNIT (X14-1780-10)  
Component side view



POWER AMPLIFIER UNIT  
(X07-2220-10)  
Component side view



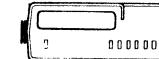
(b) DC Voltmeter



(e) DC Voltmeter

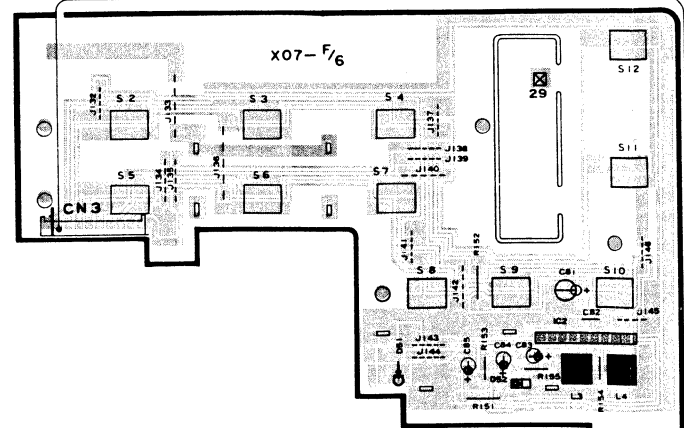
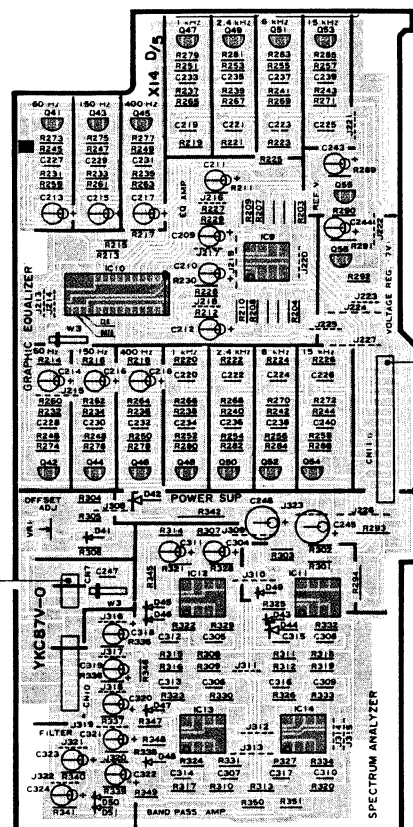
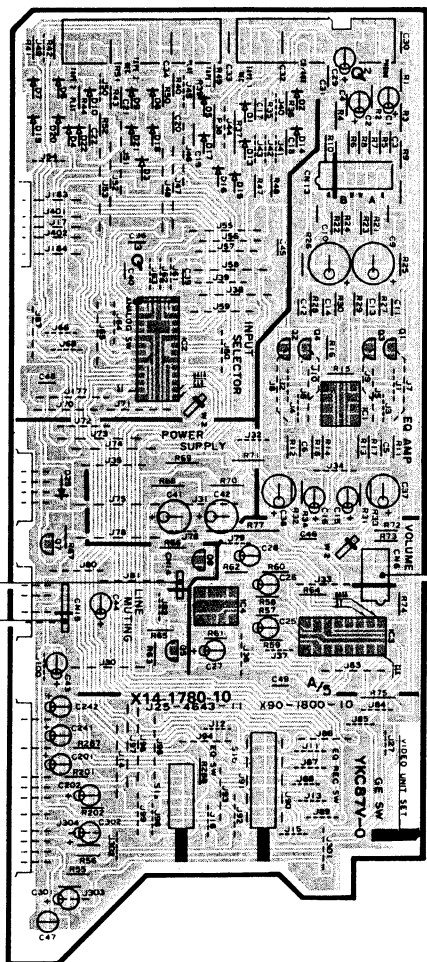


(e) DC Voltmeter



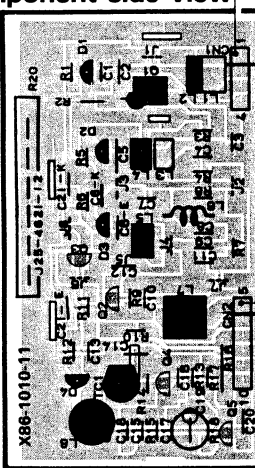
# PC BOARD

**RECEIVER UNIT (X14-1780-10)**  
Component side view



(a) DC Voltmeter

**FRONT END UNIT (X86-1010-11)**  
Component side view



(c) AC Voltmeter

Frequency counter

**X86-1010-11**

Q1	S	—
	D	95V
	G	—

**Q2**

E	1.1V
C	—
B	—

**Q4**

E	4.0V
C	—
B	—

**Q5**

E	0V
C	7.4V
B	—

**CN2**

5	0V
7	10.3V
9	0V

**X14-1780-10 (A/5)**

IC1	4	-14V
	8	13.4V

**IC2**

1	-14V
14	0V
28	13.4V

**IC3**

1	-14V
4	—
7	0V
13	—
16	13.4V

**CN15**

1	-14V
2	0V
3	5V
4	14V

**X14-1780-10 (B/5)**

CN11a	10	-14V
	12	5.5V
	13	14V

**Q1.2**

S	—
D	—
G	0V

**Q3**

S	0.5V
D	—
G	—

**Q4**

S	—
D	0.5V
G	—

**X14-1780-10 (C/5)**

IC4	1	0V
	2	0V
	3	-14V
	4	-14V
	5	0V
	6	0V
	7	13.4V
	8	13.4V

**IC5**

1	2.7V
2	2.1V
3	2.1V
4	0V
5	2.4V
6	—
7	5.6V
8	—
9	—
10	—
11	11.0V
12	4.9V
13	1.0V
14	0V
15	4.9V
16	0.4V

**IC6**

1	5.6V
2	2.1V
3	2.7V
4	0V
5	8.4V
6	2.0V
7	9.3V
8	2.7V
9	7.8V
10	0.7V
11	0V
12	2.1V
13	11.6V
14	1.5V
15	0.3V
16	2.1V
17	5.6V
18	2.9V
19	—
20	—

**IC7**

1	10.1V
2	4.4V
3	4.5V
4	0.3V
5	0V
6	FM: 0V
	AM: 6.0V
7	4.4V
8	4.2V
9	4.4V
10	4.2V
12	0V
13	4.6V
15	2.4V
16	2.2V
17	—
18	2.4V
19	—
20	4.0V

**IC8**

1	1.6V
2	0V
7	0.8V
9	FM: 12.5V
	AM: 0.5V
10	FM: 0.5V
	AM: 12.5V
11	—
12	—
13	FM: 0V
	AM: 2.7V
14	FM: 2.7V
	AM: 0V
15	0V
16	0V
20	1.0V

**Q26**

E	AM: 12.4V
C	FM: 12.4V
B	—

**Q27**

E	AM: 12.4V
C	—
B	—

**Q30**

E	12.6V
C	13.3V
B	—

**Q31**

E	5.6V
C	12.6V
B	—

**Q45,46**

E	—
C	-19V
B	—

**X14-1780-10 (D/5)**

IC9	1	0V
	2	—
	3	-14V
	4	-14V
	5	0V
	6	0V
	7	—
	8	12.9V

**IC10**

1	12.9V
2	4.1V
10	—
11	0V
14	—
15	5.5V
18	0V
19	4.1V
27	—
28	0V

**Q41-55**

E	4.1V
C	12.9V
B	—

**Q56**

E	6.4V
C	12.9V
B	7V

**X07-2220-10 (A/6)**

Q21,22,25,26	E	—
	C	51V
	B	—

**Q23,24,27,28**

E	—
C	-51V
B	—

**Q34**

E	13.5V
C	20V
B	—

**Q35**

E	—
C	20V
B	—

**Q36**

E	12.9V
C	—
B	13.5V

**Q37**

E	5.5V
C	13.5V
B	—

**Q38**

E	—
C	13.5V
B	—

**Q42**

E	-14V
C	—
B	—

**Q43,44**

E	—
C	-14V
B	—

**Q47**

E	-28V
C	—
B	—

**Q45,46**

E	—
C	-19V
B	—

**X07-2220-10 (B/6)**

Q5,6,7,8	E	12.5V
	C	—
	B	—

**CN15**

1	14V
2	5V
3	0V
4	-14V

**X07-2220-10 (D/6)**

Q48	E	5.5V
	C	—
	B	—

**CN9**

1	5V
5	0V

**X07-2220-10 (F/6)**

IC2	1	4.5V
	2	0V
	3	0.9V
	4	4.4V
	5	0V
	6	0.7V
	7	3V

**IC11**

1	0.6V
2	—
3	-14V
5	0V
6	—
8	12.9V

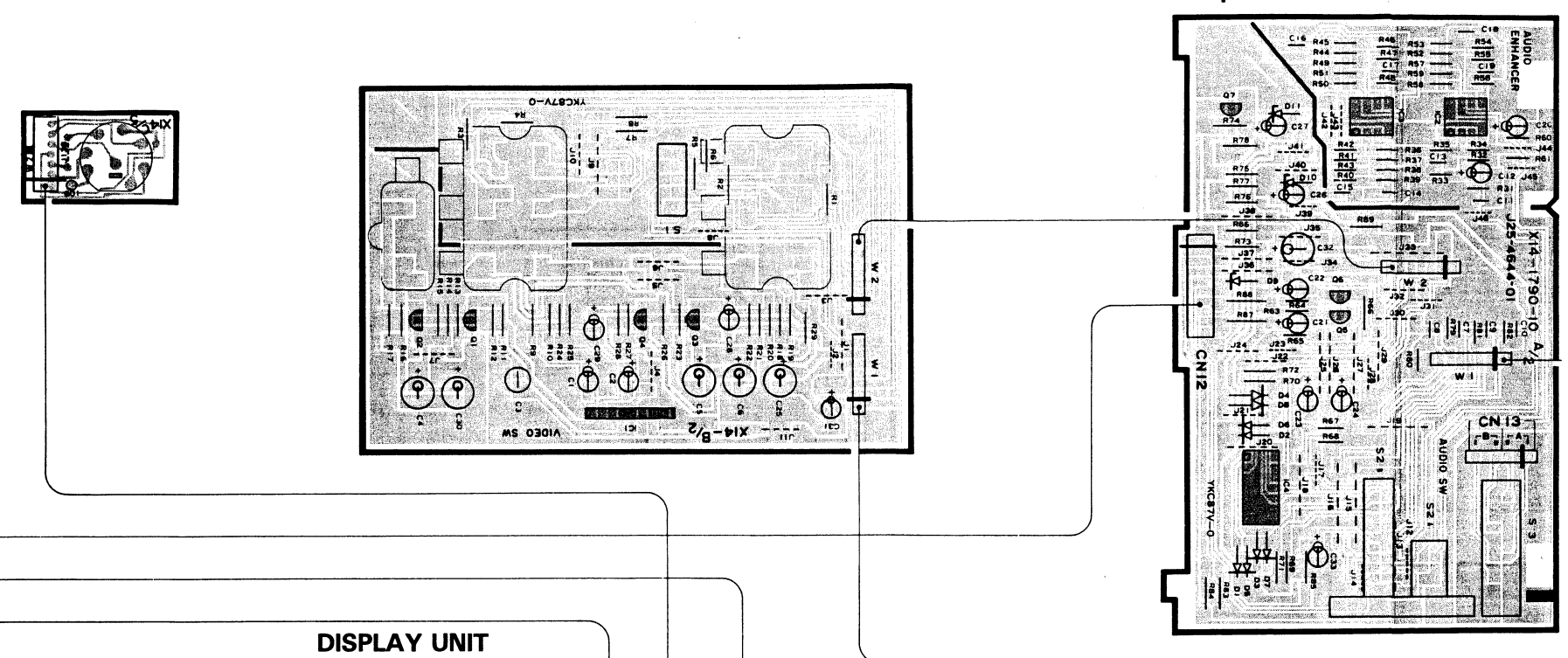
**IC12,13,14**

1	0.6V
2	—
3	-14V
5	0.6V
6	—
7	6.8V

Refer to the schematic diagram for the values of resistors and capacitors.  
The PC board drawing is viewing from the side easy to check.

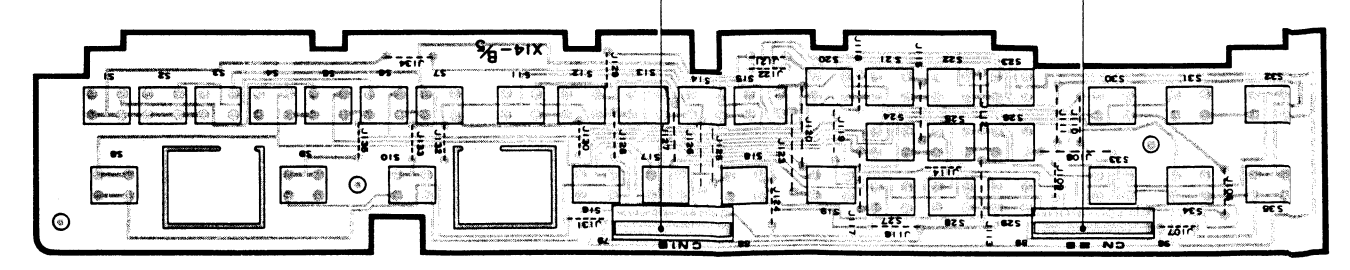
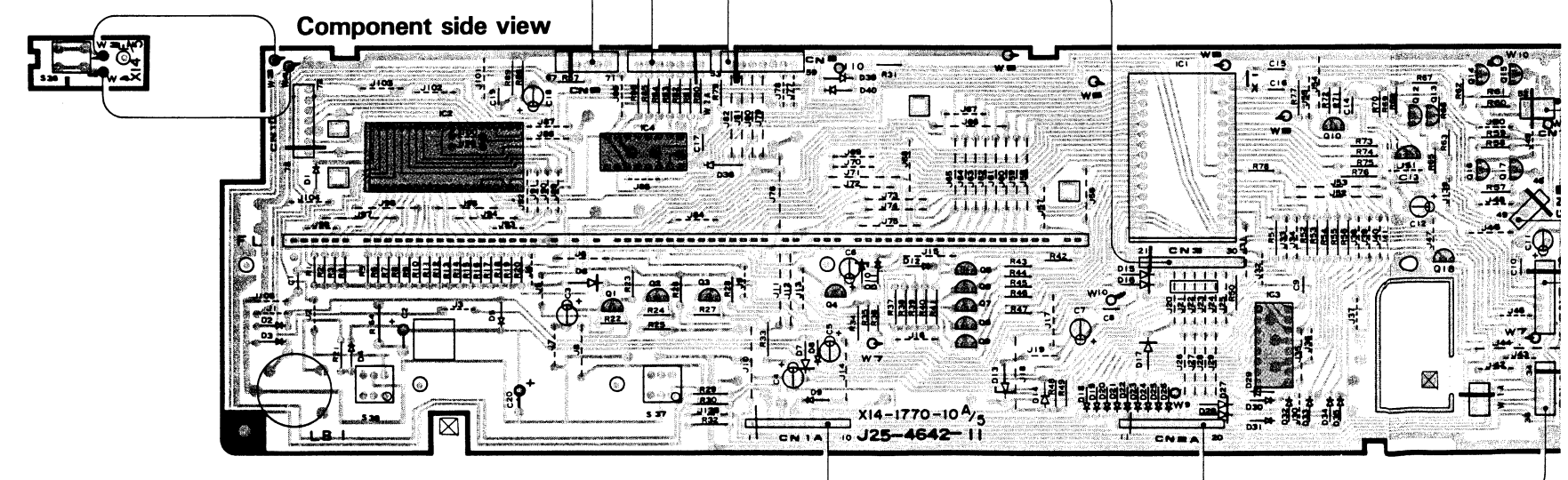
PC BOARD

VIDEO CONTROL UNIT (X14-1790-10)  
Component side view



DISPLAY UNIT  
(X14-1770-10)

Component side view



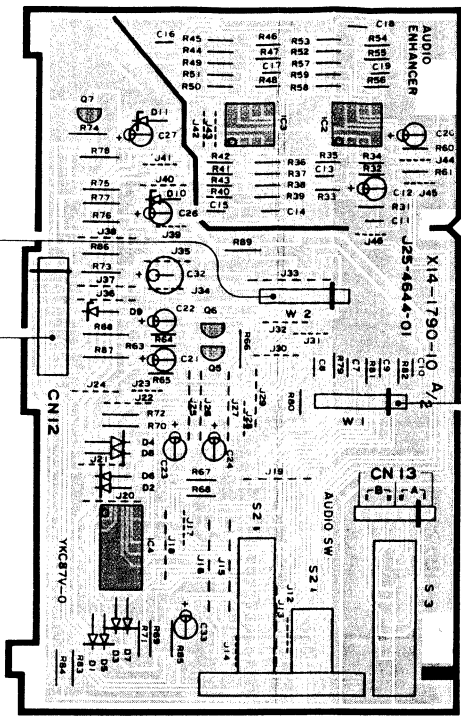
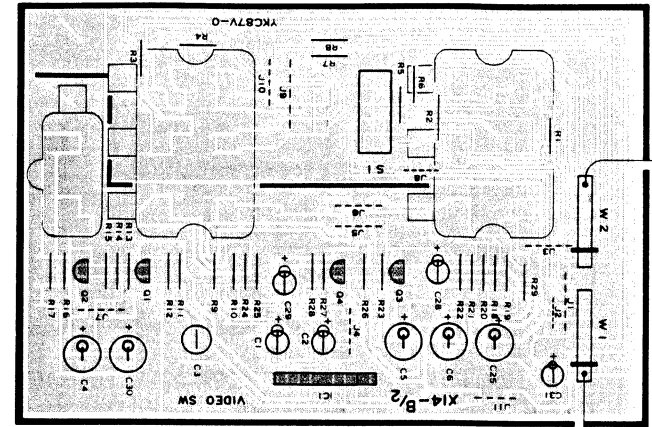
F  
B  
H  
A

E  
D  
C  
G



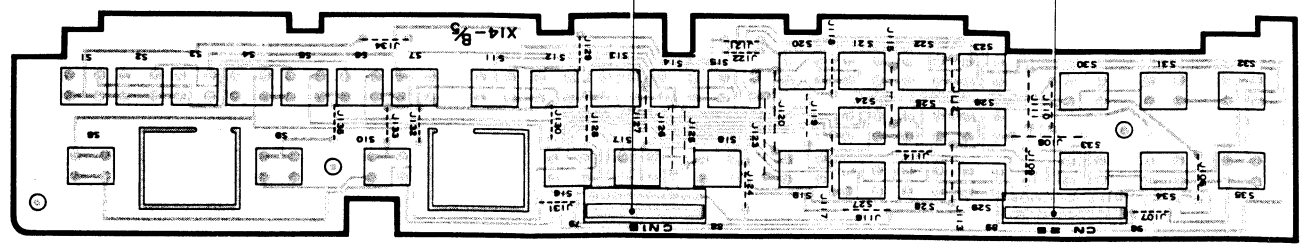
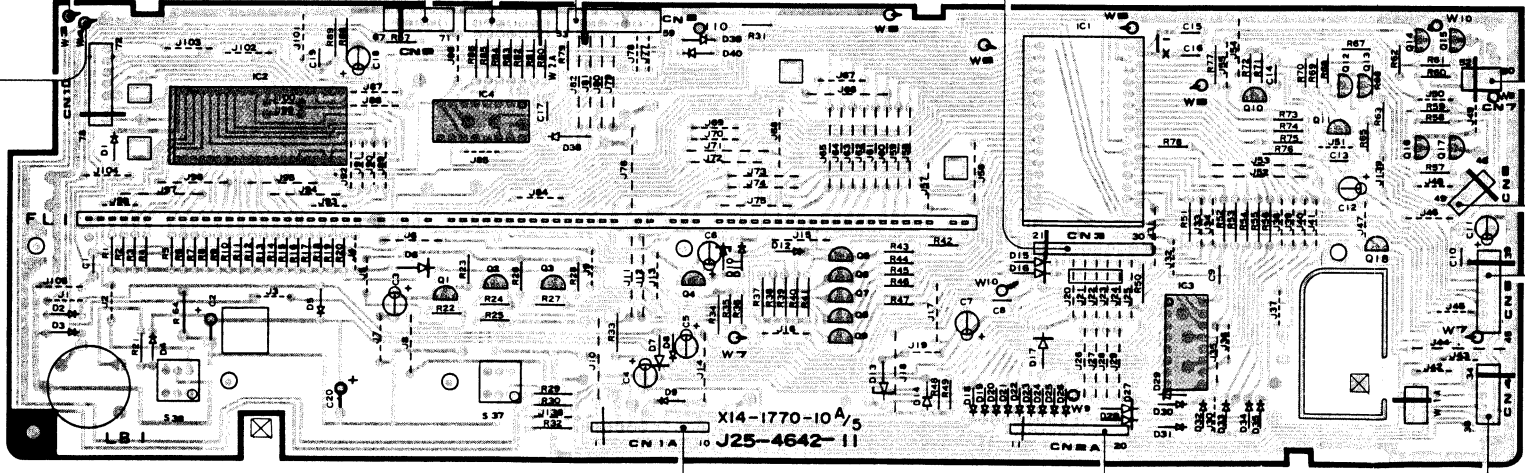
# PC BOARD

## VIDEO CONTROL UNIT (X14-1790-10) Component side view



## DISPLAY UNIT (X14-1770-10)

### Component side view



X14-1790-10 (A/2)

1	6.2V
2	6.1V
3	0V
4	0V
5	6.2V
6	6.2V
7	11.5V

IC3

1	6.2V
2	6.2V
3	0V
4	0V
5	6.2V
6	6.2V
7	11.5V

IC4

1	0V
2	0V
3	-6.2V
9	-6.2V
10	0V
11	0V
12	6.1V
13	-6.1V
14	6.2V

Q5

E	-1.6V
C	11.5V
B	-1.2V

Q6

E	-1.4V
C	11.5V
B	-0.7V

Q7

E	-6.2V
C	6.1V
B	-6.1V
B	-6.2V

X14-1790-10 (B/2)

3	0V
4	4.7V
5	10V
6	5.5V
7	5.5V
8	5.6V

Q1

E	5.5V
C	10V
B	6.1V

Q2

E	4.9V
C	10V
B	5.5V

Q3

E	5.1V
C	10V
B	5.7V

Q4

E	5.1V
C	10V
B	5.7V

X14-1770-10 (A/5)

8	5V
29	0V
32	-28V
57	-28V
64	5V

Q1, 2, 3

E	5V
C	-
B	-

Q4

E	-28V
C	-
B	-

Q5, 6, 7, 8, 9

E	-
C	5V
B	-

Q10, 11, 12, 13, 14, 15, 16, 17

E	0V
C	-
B	-

FL1

24	5.5V
26	5.5V

CN8

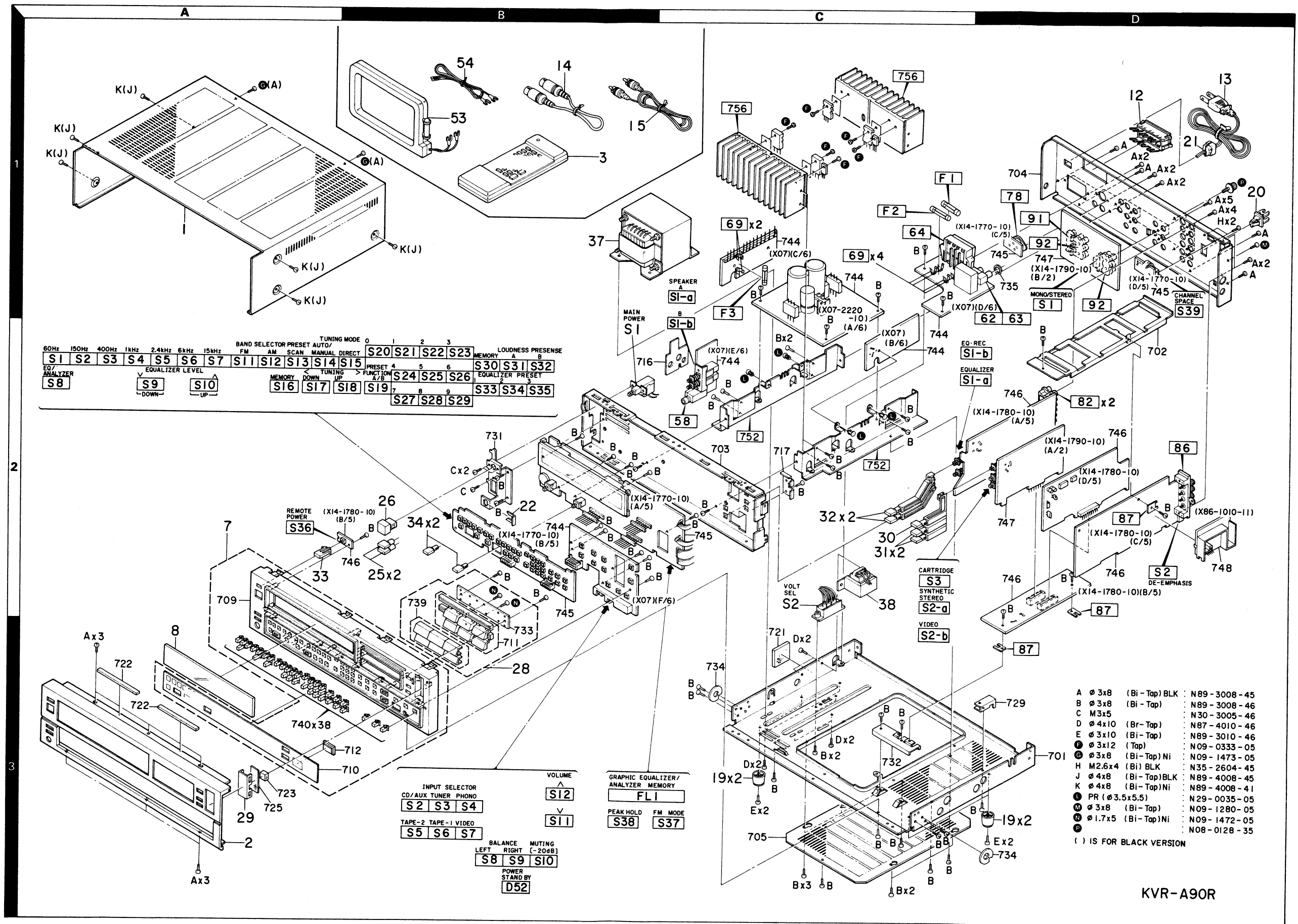
54	5.5V
55	-28V
57	0V

IC2,3

15	0V
16	0V
19	0V
23	0V
32	0V
42	5V

Refer to the schematic diagram for the values of resistors and capacitors.  
The PC board drawing is viewing from the side easy to check.

## EXPLODED VIEW



**Parts with the exploded numbers larger than 700 are not supplied.**

## PARTS LIST

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Teile ohne Parts No. werden nicht geliefert.

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
参照番号	位置	新	部品番号	部品名/規格	仕向	備考
<b>KVR-A90R</b>						
1	1A	*	A01-1419-02	METALLIC CABINET	KUUE	B
1	1A	*	A01-1420-02	METALLIC CABINET	K	S
2	3A	*	A20-4373-02	PANEL	KUUE	B
2	3A	*	A20-4375-02	PANEL	K	S
3	1B	*	A70-0127-05	REMOTE CONTROLLER ASSY		
7	2A	*	B01-0283-01	PANEL ESCUTCHEON ASSY	KUUE	B
7	2A	*	B01-0293-01	PANEL ESCUTCHEON ASSY	K	S
8	3A	*	B10-0583-03	FRONT GLASS		
-			B46-0092-03	WARRANTY CARD	KK	
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-		*	B50-5704-00	INSTRUCTION MANUAL (ENGLISH)		
-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
-			B58-0269-04	CAUTION CARD	KK	
-			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
12	1D	*	E03-0075-05	AC OUTLET		
13	1D		E30-0780-05	AC POWER CORD	KK	
13	1D		E30-0812-05	AC POWER CORD	UUE	
14	1B		E30-0950-05	CORD WITH DIN CONN (CASSETTE)		
15	1B		E30-1360-05	AUDIO CORD (CD)		
-		*	H01-5484-04	ITEM CARTON CASE	KUUE	B
-		*	H01-5600-04	ITEM CARTON CASE	K	S
-		*	H10-1800-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-1801-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0181-04	PROTECTION BAG (150X260X0.05)		
-			H25-0224-04	PROTECTION BAG (800X400)		
-			H25-0232-04	PROTECTION BAG (235X350)		
19	3C, 3D		J02-0126-05	FOOT		
20	1D		J19-0626-12	ANTENNA HOLDER		
21	1D		J42-0083-05	POWER CORD BUSHING		
22	2B		J21-3326-05	JACK MOUNTING HARDWARE		
-			J61-0307-05	WIRE BAND		
25	2B		K27-1304-04	KNOB (BUTTON) SPEAKERS	KUUE	B
25	2B	*	K27-1487-04	KNOB (BUTTON) SPEAKERS	K	S
26	2B		K29-1446-04	KNOB ASSY(BTN) MAIN POWER	K	S
26	2B		K29-2001-04	KNOB ASSY(BTN) MAIN POWER	KUUE	B
28	3B	*	K29-2095-03	KNOB ASSY(BTN) INPUT SELECTOR	KUUE	B
28	3B	*	K29-2096-03	KNOB ASSY(BTN) INPUT SELECTOR	K	S
29	3A	*	K29-2105-04	KNOB (BUTTON) VOLUME	KUUE	B
29	3A	*	K29-2106-04	KNOB (BUTTON) VOLUME	K	S
30	2C	*	K29-2126-04	KNOB ASSY(BTN) MM/MC	KUUE	B
30	2C	*	K29-2127-04	KNOB ASSY(BTN) MM/MC	K	S
31	2C	*	K29-2129-04	KNOB ASSY(BTN) VIDEO, SYNTH		
32	2C	*	K29-2130-04	KNOB ASSY(BTN) EQ ON, EQ REC		
33	2A	*	K29-2135-04	KNOB (BUTTON) REMOTE POWER		
34	2B		K27-0965-04	KNOB (BTN) FM MODE, PEAK HOLD		
37	1B	*	L01-6661-05	POWER TRANSFORMER (MAIN)	KK	
37	1B	*	L01-6665-05	POWER TRANSFORMER (MAIN)	UUE	
38	2C	*	L01-6681-05	POWER TRANSFORMER (REMOTE)	KK	
38	2C	*	L01-6687-05	POWER TRANSFORMER (REMOTE)	UUE	

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UE: AAFES(Europe) X: Australia M: Other Areas

Destination:

K: KVR-A90R (Silver)

Others: KVR-A90R (Black)

A indicates safety critical components.

## PARTS LIST

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参照番号	位置	新	部品番号	部品名/規格	仕向	備考
G			N09-1473-05	TAPPING SCREW (Ø3X8)	K	S
M			N09-1280-05	TAPTITE SCREW (Ø3X8)		
N			N09-1472-05	TAPTITE SCREW (Ø1.7X5)		
P			N08-0128-35	BINDING POST (GND)		
S1	2B		S40-1073-05	PUSH SWITCH (MAIN POWER)		
S2	2C		S31-2053-05	SLIDE SWITCH (POWER TYPE)	UUE	
53	1B		T90-0104-15	LOOP ANTENNA		
54	1B		T90-0132-05	T TYPE ANTENNA		
<b>POWER AMPLIFIER UNIT (X07-2220-10)</b>						
D52	3B		B30-1012-05	LED(SLP-981C-50) STAND-BY		
C1 ,2			CE04FW1H2R2M	ELECTRO 2.2UF 50WV		
C3 ,4			CC45FSL1H470J	CERAMIC 47PF J		
C7 ,8			CF92FV1H682J	MF 6800PF J		
C9 ,10			CE04FW1A101M	ELECTRO 100UF 10WV		
C11 ,12			CC45FSL1H120J	CERAMIC 12PF J		
C13 ,14			CC45FSL1H220J	CERAMIC 22PF J		
C15 ,16			CC45FSL1H010C	CERAMIC 1.0PF C		
C17 ,18			CC45FSL1H330J	CERAMIC 33PF J		
C21 ,22			CC45FSL1H221J	CERAMIC 220PF J		
C25 ,26			CC45FSL1H101J	CERAMIC 100PF J		
C27 ,30			C91-0769-05	CERAMIC 0.01UF M		
C31 ,32			CF92FV1H473J	MF 0.047UF J		
C37 ,38			CE04FW1J470M	ELECTRO 47UF 63WV		
C39			CE04FW1E470M	ELECTRO 47UF 25WV		
C40			CK45FF1H103Z	CERAMIC 0.010UF Z		
C41			CE04HW1A220M	NP-ELEC 22UF 10WV		
C42			CE04FW1H330M	ELECTRO 33UF 50WV		
C43 ,44			C90-0538-05	ELECTRO 7500UF 56WV		
C45			CE04FW1H2R2M	ELECTRO 2.2UF 50WV		
C46			CE04FW1E332M	ELECTRO 3300UF 25WV		
C47			CE04FW1A470M	ELECTRO 47UF 10WV		
C48 ,49			CE04FW1C470M	ELECTRO 47UF 16WV		
C50			CE04FW1A220M	ELECTRO 22UF 10WV		
C51			CE04FW1C100M	ELECTRO 10UF 16WV		
C52			CE04FW1C470M	ELECTRO 47UF 16WV		
C53			C91-0745-05	CERAMIC 100PF K		
C54			CE04FW1E470M	ELECTRO 47UF 25WV		
C55			CE04FW1V330M	ELECTRO 33UF 35WV		
C56 ,57			CK45FF1H103Z	CERAMIC 0.010UF Z		
C58			CK45B1H102K	CERAMIC 1000PF K		
C65			CE04FW1C471M	ELECTRO 470UF 16WV	KK	
C65			CE04FW1V331M	ELECTRO 330UF 35WV	UUE	
C66			CE04FW1V477M	ELECTRO 4.7UF 35WV		
C67			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C68			C91-0023-05	CERAMIC 0.01UF AC250V	UUE	
C68			C91-0647-05	CERAMIC 0.01UF P	KK	
C81			CE04FW1A101M	ELECTRO 100UF 10WV		
C82			CK45FF1H473Z	CERAMIC 0.047UF Z		
C83 ,84		*	CE04JW0J100M	ELECTRO 10UF 6.3WV		
C85			CE04JW1H010M	ELECTRO 1.0UF 50WV		
58	2C		E11-0127-05	PHONE JACK(3P) HEADPHONE		
62	1D		E11-0152-05	MINI PHONE JACK(3P) PLAYER		
63	1D		E13-0119-05	PHONE JACK(1P) CD		

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Destination:

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Ref. No. 参照番号	Address 位置	New Parts	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
64	1C		E20-0823-05	LOCK TERMINAL BOARD(8P) SPKR		
△ F1	1C		F05-6027-05	FUSE (UL) (250V 6A)	KK	
△ F1 ,2	1C		F05-3022-05	FUSE (250V 3A)	UUE	
△ F3	1C		F05-1521-05	FUSE (250V 1.5A)	UUE	
△ F3	1C		F06-1521-05	FUSE (UL) (250V 1.5A)	KK	
69	1C		J13-0041-05	FUSE CLIP		
L1 ,2			L39-0085-05	PHASE-COMPENSATION COIL		
L3 ,4			L39-0123-05	PEAKING COIL		
F			N09-0333-05	TAPPING SCREW (Ø3X12)		
L			N29-0035-05	PUSH RIVET (Ø3.5X5.5)		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R23 -26		*	RD14AB2E102J	FL-PROOF RD 1.0K J 1/4W		
R27 ,28			RD14AB2E161J	FL-PROOF RD 160 J 1/4W		
R33 -36			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R47 -50			RD14AB2E220J	FL-PROOF RD 22 J 1/4W		
R51 -54			RD14AB2E2R2J	FL-PROOF RD 2.2 J 1/4W		
R55 -58			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R73			RD14AB2E220J	FL-PROOF RD 22 J 1/4W		
R74			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R83			RS14KB3D102J	FL-PROOF RS 1.0K J 2W		
R85 ,86			RS14KB3D4R7J	FL-PROOF RS 4.7 J 2W		
R107,108			RS14DB3A681J	FL-PROOF RS 680 J 1W		
R112			RS14DB3A181J	FL-PROOF RS 180 J 1W		
R114			RD14AB2E470J	FL-PROOF RD 47 J 1/4W		
R115,116			RS14DB3A100J	FL-PROOF RS 10 J 1W		
R117			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R121,122			RS14DB3A561J	FL-PROOF RS 560 J 1W		
R123			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
R128,129			RD14AB2E390J	FL-PROOF RD 39 J 1/4W	UUE	
R130			R92-0173-05	RC 2.2M M 1/2W	KK	
R152			RD14AB2E470J	FL-PROOF RD 47 J 1/4W		
VR1, 2		*	R12-1066-05	TRIMMING POT. (1K) BIAS		
K1			S51-2045-05	MAGNETIC RELAY		
K2			S51-1036-05	MAGNETIC RELAY		
S1	1C	*	S42-2130-05	MULTIPLE PUSH SW (SPEAKERS)		
S2 -12	3B		S40-1064-05	PUSH SW (CD/AUX, TUNER, ETC.)		
D1 ,2			1SS133	DIODE		
D3 ,4			RD11E(B2)	ZENER DIODE		
D5 -10			1SS178	DIODE		
D13			DSM1A1	DIODE		
D14			1SS178	DIODE		
D15 -18			DSM1A1	DIODE		
D19			RD13E(B2)	ZENER DIODE		
D20 ,21			1SS133	DIODE		
D22			RD8.2E(B)	ZENER DIODE		
D23			RD15E(B)	ZENER DIODE		
D24 -27			GP25DL	DIODE		
D28			RD5.1E(B)	ZENER DIODE		
D29 ,30			RD16E(B2)	ZENER DIODE	UUE	
D29 ,30			RD20E(B2)	ZENER DIODE	KK	
D31 -34			DSM1A1	DIODE		

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D35 ,36			1SS178	DIODE		
D37			FD6.2E(B2)	ZENER DIODE		
D38			DSM1A1	DIODE		
D39			RD15E(B)	ZENER DIODE		
D43 ,44			1SS133	DIODE		
D51			PH302B	PHOTO DIODE		
IC1			UPC1237H	IC (PROTECTION)		
IC2			UPC1474HA	IC (REMOTE CONTROLLER PREAMP)		
Q1 -8			2SC945(A) (Q,P)	TRANSISTOR		
Q9 -14			2SA992(F,E)	TRANSISTOR		
Q15 ,16		*	2SC1845(F,E)	TRANSISTOR		
Q17 ,18			2SC3419	TRANSISTOR		
Q19 ,20			2SA733(A) (Q,P)	TRANSISTOR		
Q19 ,20			2SA999(E,F)	TRANSISTOR		
Q21 ,22			2SC2590(Q,R,S)	TRANSISTOR		
Q23 ,24			2SA1110(Q,R,S)	TRANSISTOR		
Q25 ,26			2SC3280*5	TRANSISTOR		
Q27 ,28			2SA1301*5	TRANSISTOR		
Q29 -32			2SA992(F,E)	TRANSISTOR		
Q33			2SC2320(E,F)	TRANSISTOR		
Q33			2SC945(A) (Q,P)	TRANSISTOR		
Q34			2SC2167	TRANSISTOR		
Q35 ,36			2SC2320(E,F)	TRANSISTOR		
Q35 ,36			2SC945(A) (Q,P)	TRANSISTOR		
Q37			2SC2003(L,K)	TRANSISTOR		
Q38			2SC2320(E,F)	TRANSISTOR		
Q38			2SC945(A) (Q,P)	TRANSISTOR		
Q39 -42			2SA733(A) (Q,P)	TRANSISTOR		
Q39 -42			2SA999(E,F)	TRANSISTOR		
Q43 ,44			2SC2167	TRANSISTOR		
Q45			2SC2003(L,K)	TRANSISTOR		
Q46			2SC2320(E,F)	TRANSISTOR		
Q46			2SC945(A) (Q,P)	TRANSISTOR		
Q47			2SA957	TRANSISTOR		
Q48			2SC2003(L,K)	TRANSISTOR		
Q48			2SC2167	TRANSISTOR		
Q49			2SA733(A) (Q,P)	TRANSISTOR		
Q49			2SA999(E,F)	TRANSISTOR		
Q50			2SC2320(E,F)	TRANSISTOR		
Q50			2SC945(A) (Q,P)	TRANSISTOR		
Q51			2SC2003(L,K)	TRANSISTOR		
Q51 ,52			2SC2167	TRANSISTOR		
DISPLAY UNIT (X14-1770-10)						
C1		*	CK45FF1H223Z	CERAMIC	0.022UF	Z
C2			CE04DWOJ471M	ELECTRO	470UF	6.3WV
C3			CE04W1A470M	ELECTRO	47UF	10WV
C4			CE04W1V4R7M	ELECTRO	4.7UF	35WV
C5			CE04W1H010M	ELECTRO	1.0UF	50WV
C6			CE04W1H100M	ELECTRO	10UF	50WV
C7			CE04W1A330M	ELECTRO	33UF	10WV
C8 ,9			CK45FF1H223Z	CERAMIC	0.022UF	Z
C10			CK45FF1H103Z	CERAMIC	0.010UF	Z
C11 ,12			CE04FW1V4R7M	ELECTRO	4.7UF	35WV
C13 ,14			CF92FV1H104J	MF	0.10UF	J

E: Scandinavia &amp; Europe H: Audio Club K: USA P: Canada

S: South Africa T: England U: PX(Far East, Hawaii)

U: AAFES(Europe) X: Australia M: Other Areas

Destination:

K: KVR-A90R (Silver)

Others: KVR-A90R (Black)

△ indicates safety critical components.

# KVR-A90R KVR-A90R

## PARTS LIST

\* New Parts

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
C15 ,16 C17 C18 C19			CC45FSL1H330J CK45FF1H223Z CE04FW1V4R7M CK45FB1H152K	CERAMIC 33PF J CERAMIC 0.022UF Z ELECTRØ 4.7UF 35WV CERAMIC 1500PF K		
78	1D		E06-0805-15	CYLINDRICAL RECEPTACLE (DIN)		
L1 X1		*	L40-1021-11 L78-0207-05	SMALL FIXED INDUCTOR (1.0MH,K) RESONATOR (4.194MHZ)		
S1 -36 S37 ,38 S39	2A,2B 3C 1D	*	S40-1064-05 S40-2343-05 S31-2072-05	PUSH SW(FUNCTIONS=EQ,TUNER,ETC) PUSH SW (FMMODE,PEAKHOLD) SLIDE SW (CHANNEL SPACE)	UUE	
D1 -9 D10 D11 ,12 D13 D14 -33		*	1SS133 RD20E(B) 1SS131 RD10E(B) 1SS133	DIODE ZENER DIODE DIODE ZENER DIODE DIODE		
D36 -40 D38 -40 FL1 IC1 IC2		*	1SS133 1SS133 FIP18AMW24 UPD7519G-172-36 LC7565	DIODE DIODE FLUORESCENT INDICATOR TUBE IC(MICROPROCESSOR) IC(GRAPHIC EQ FL DISPLAY DR)	UUE KK	
IC3 ,4 IC3 ,4 Q1 -3 Q1 -3 Q4		*	MB84028BM UPD4028BC 2SA733(A)(Q,P) 2SA933S(Q,R) 2SC1845(F,E)	IC(BCD-TØ-DECIMAL DECØDER) IC(BCD-TØ-DECIMAL DECØDER) TRANSISTOR TRANSISTOR TRANSISTOR		
Q5 -17 Q5 -17 Q18		*	2SC1740S(Q,R) 2SC945(A)(Q,P) 2SC945(A)(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR		
RECEIVER UNIT (X14-1780-10)						
C3 ,4 C5 ,6 C9 ,10 C11 ,12 C13 ,14			C91-0749-05 CC45FSL1H331J CE04FW0J102M CF92FV1H113J CF92FV1H393J	CERAMIC 220PF K CERAMIC 330PF J ELECTRØ 1000UF 6.3WV MF 0.011UF J MF 0.039UF J		
C15 ,16 C17 -22 C25 -28 C29 C30 -35		*	CE04FW1V4R7M C91-0755-05 CE04FW1H2R2M CE04FW1H010M C91-0769-05	ELECTRØ 4.7UF 35WV CERAMIC 680PF K ELECTRØ 2.2UF 50WV ELECTRØ 1.0UF 50WV CERAMIC 0.01UF M		
C36 C37 ,38 C39 ,40 C41 ,42 C43			CK45FF1H473Z CE04FW1C470M CK45FF1H473Z CE04FW1C101M CE04FW1A470M	CERAMIC 0.047UF Z ELECTRØ 47UF 16WV CERAMIC 0.047UF Z ELECTRØ 100UF 16WV ELECTRØ 47UF 10WV		
C44 C45 ,46 C47 C48 C49			CE04FW1H010M CK45FF1H473Z CE04HW1H3R3M CK45FB1H102K CK45FF1H473Z	ELECTRØ 1.0UF 50WV CERAMIC 0.047UF Z NP-ELEC 3.3UF 50WV CERAMIC 1000PF K CERAMIC 0.047UF Z		
C101 C102 C103-107 C108			CE04FW1C330M CE04FW1H010M C91-0769-05 CE04FW1H010M	ELECTRØ 33UF 16WV ELECTRØ 1.0UF 50WV CERAMIC 0.01UF M ELECTRØ 1.0UF 50WV		

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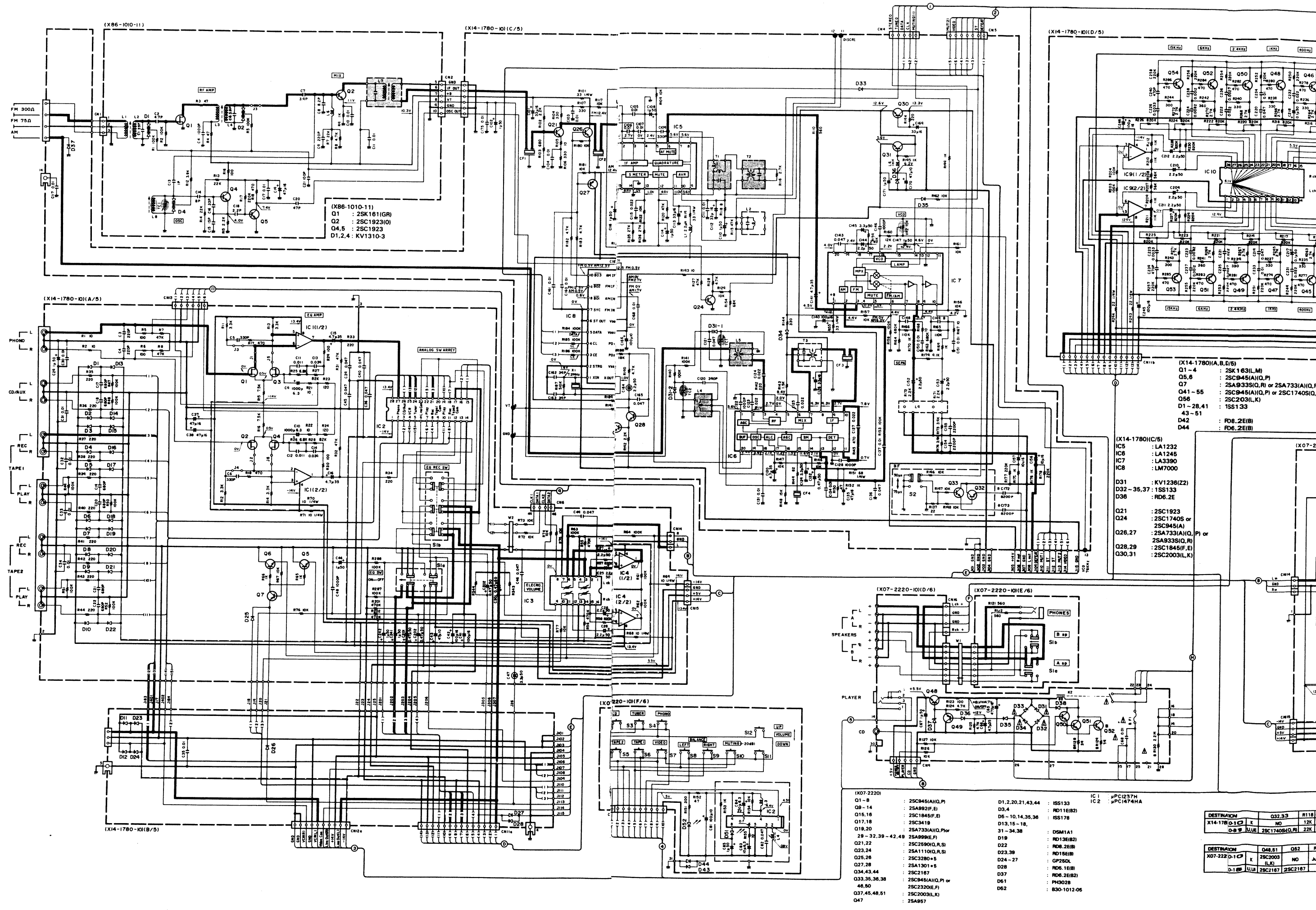
Telle ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
C109 C109 C110 C111 C112,113		*	C91-0751-05 C91-0754-05 CE04FW1H010M C91-0769-05 CE04FW1C330M	CERAMIC 330PF K CERAMIC 560PF K ELECTRØ 1.0UF 50WV CERAMIC 0.01UF M ELECTRØ 33UF 16WV	KK UUE	
C114 C115 C116 C117 C120			CE04FW1H010M CK45FF1H223Z CE04FW1H010M C91-0769-05 CØØ9FS1H391JYØ	ELECTRØ 1.0UF 50WV CERAMIC 0.022UF Z ELECTRØ 1.0UF 50WV CERAMIC 0.01UF M POLYSTY 390PF J		
C121 C122 C123-125 C126 C127			CK45FF1H473Z C91-0757-05 CK45FF1H223Z CE04FW1C330M CK45FF1H223Z	CERAMIC 0.047UF Z CERAMIC 0.001UF K CERAMIC 0.022UF Z ELECTRØ 33UF 16WV CERAMIC 0.022UF Z		
C128 C129 C130 C131 C132			C91-0757-05 CE04FW1H3R3M CE04FW1V4R7M C91-0769-05 CE04FW1HR47M	CERAMIC 0.001UF K ELECTRØ 3.3UF 50WV ELECTRØ 4.7UF 35WV CERAMIC 0.01UF M ELECTRØ 0.47UF 50WV		
C134 C135 C136 C137 C140			C91-0769-05 CE04FW1C470M CF92FV1H473J CF92FV1H103J CE04FW1C101M	CERAMIC 0.01UF M ELECTRØ 47UF 16WV MF 0.047UF J MF 0.010UF J ELECTRØ 100UF 16WV		
C141 C143 C144 C145 C146			CE04FW1V4R7M CF92FV1H473J CE04FW1H2R2M CE04FW1H3R3M CØØ9FS1H102JYØ	ELECTRØ 4.7UF 35WV MF 0.047UF J ELECTRØ 2.2UF 50WV ELECTRØ 3.3UF 50WV POLYSTY 1000PF J		
C147 C148,149 C148,149 C150,151 C152,153			CE04FW1H010M CC45FSL1H12ØJ CK45FB1H681K C91-0769-05 CE04FW1H2R2M	ELECTRØ 1.0UF 50WV CERAMIC 1.0UF J CERAMIC 680PF K CERAMIC 0.01UF M ELECTRØ 2.2UF 50WV	UUE KK	
C154,155 C156,157 C156,157 C160,161 C162,163			CF92FV1H222J CE04FW1C100M CE04FW1H010M C91-0769-05 CC45FCH1H390J	MF 2200PF J ELECTRØ 10UF 16WV ELECTRØ 1.0UF 50WV CERAMIC 0.01UF M CERAMIC 39PF J	KK KK UUE	
C164 C165 C166 C167,168 C169			CE04HW1H2R2M CF92FV1H473J CE04FW1A101M C91-0769-05 CE04FW1C330M	NP-ELEC 2.2UF 50WV MF 0.047UF J ELECTRØ 100UF 10WV CERAMIC 0.01UF M ELECTRØ 33UF 16WV		
C170 C171 C172,173 C175 C176,177		*	CE04FW1A470M CE04FW1H010M CF92FV1H133J C91-0769-05 CF92FV1H243J	ELECTRØ 47UF 10WV ELECTRØ 1.0UF 50WV MF 0.013UF J CERAMIC 0.01UF M MF 0.024UF J	UUE	
C178 C209-212 C213,214 C215,216 C217,218			C91-0745-05 CE04FW1H2R2M CE04FW1H010M CE04FW1HR22M CE04FW1HOR1M	CERAMIC 100PF K ELECTRØ 2.2UF 50WV ELECTRØ 1.0UF 50WV ELECTRØ 0.22UF 50WV ELECTRØ 0.1UF 50WV	UUE	

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S: South Africa T: England U: PX(Far East, Hawaii)  
UE: AAFES(Europe) X: Australia M: Other Areas

Destination:  
K: KVR-A90R (Silver)  
Others: KVR-A90R (Black)

△ indicates safety critical components.



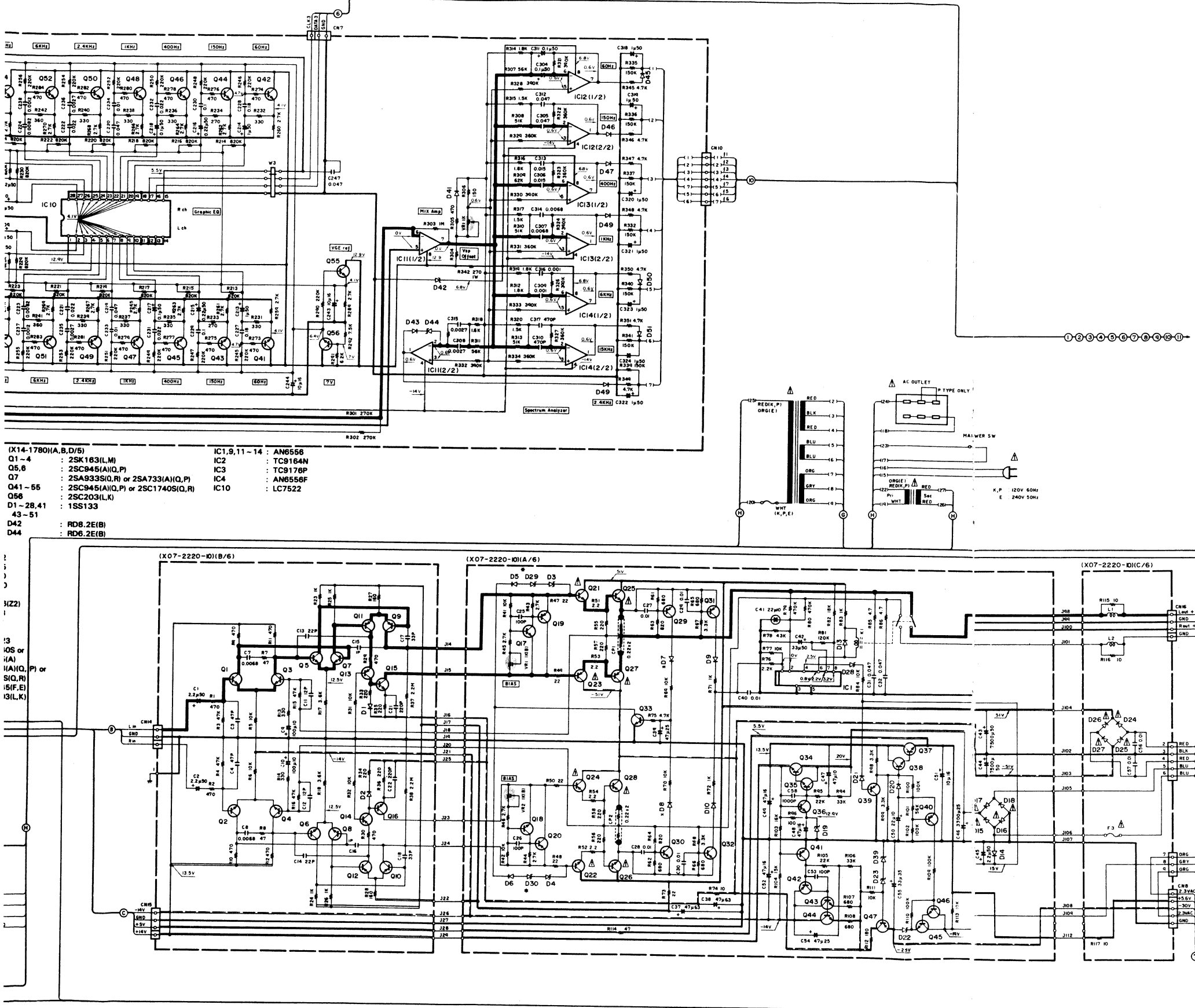
- (X14-1780-10)(D/5)
- Q1-4 : 2SK163(L,M)
  - Q5,8 : 2SC945(A)(Q,P)
  - Q7 : 2SA933S(Q,R) or 2SA733(A)(Q,P)
  - Q41-55 : 2SC945(A)(Q,P) or 2SC1740S(Q,F)
  - Q66 : 2SC203(L,K)
  - D1-28,41 : 1SS133
  - 43-51 : F08.2E(B)
  - D42 : F08.2E(B)
  - D44 : F08.2E(B)

- (X14-1780)(C/5)
- IC5 : LA1232
  - IC6 : LA1245
  - IC7 : LA3390
  - IC8 : LM7000
- (X07-2220-10)(D/6)
- D31 : KV1236(Z2)
  - D32-35,37 : 1SS133
  - D36 : RD6.2E
- (X07-2220-10)(E/6)
- Q21 : 2SC1923
  - Q24 : 2SC1740S or 2SC945(A)
  - Q26,27 : 2SA733(A)(Q,P) or 2SA933S(Q,R)
  - Q28,29 : 2SC1845(F,E)
  - Q30,31 : 2SC2003(L,K)

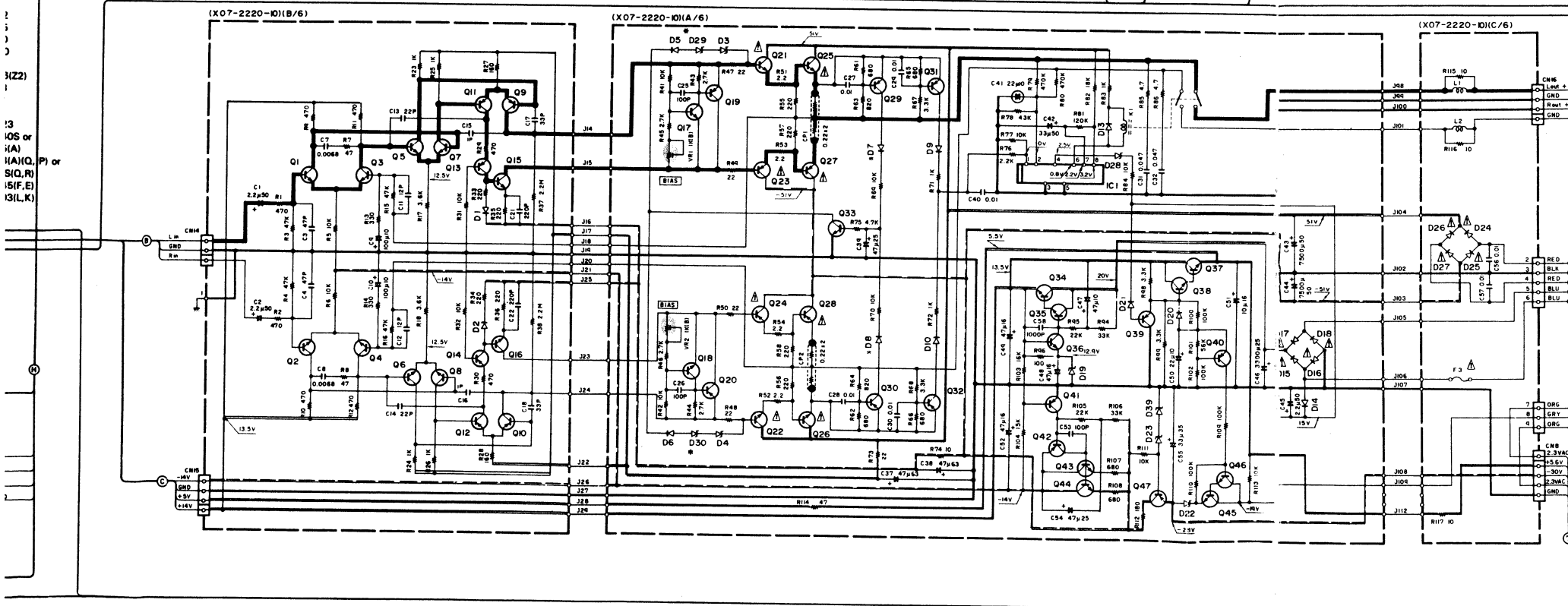
- (X07-2220)
- Q1-8 : 2SC945(A)(Q,P)
  - Q9-14 : 2SA992(F,E)
  - Q15,16 : 2SC1845(F,E)
  - Q17,18 : 2SC3418
  - Q19,20 : 2SA733(A)(Q,P) or 2SA990(F,E)
  - Q21,22 : 2SC2590(Q,R,S)
  - Q23,24 : 2SA1110(Q,R,S)
  - Q25,26 : 2SC3280+5
  - Q27,28 : 2SA1301+5
  - Q34,43,44 : 2SC2167
  - Q33,35,36,38 : 2SC945(A)(Q,P) or 2SC2320(E,F)
  - 46,50 : 2SC2003(L,K)
  - Q37,45,48,51 : 2SC2003(L,K)
  - Q47 : 2SA957
- (X07-2220-10)(G/6)
- D1,2,20,21,43,44 : 1SS133
  - D3,4 : RD11E(B2)
  - D5-10,14,35,36 : 1SS178
  - D13,15-18 : DSM1A1
  - D19 : RD13E(B2)
  - D22 : RD6.2E(B)
  - D23,39 : RD13E(B)
  - D24-27 : QP350V
  - D28 : RD6.1E(B)
  - D37 : RD6.2E(B2)
  - D61 : PH3028
  - D62 : 830-1012-06

DESTINATION	Q32,33	R118	C
X14-1780-10(C/5)	NO	12K	
Q-8	100K	2SC1740S(Q,R)	22K

DESTINATION	Q48,51	Q52	R1
X07-2220-10(C/6)	NO	2SC2003	12K
Q-1	100K	2SC2167	2SC2167



- (X14-1780)(A,B,D/5)
- Q1-4 : 2SK163(L,M)
  - Q5,8 : 2SC945(A)(Q,P)
  - Q7 : 2SA933S(Q,R) or 2SA733(A)(Q,P)
  - Q41-55 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
  - Q56 : 2SC203(L,K)
  - D1-28,41 : 1SS133
  - 43-51 : 1SS133
  - D42 : RD6.2E(B)
  - D44 : RD6.2E(B)
- IC1,9,11-14 : AN6556
- IC2 : TC9164N
  - IC3 : TC9176P
  - IC4 : AN6556F
  - IC10 : LC7522



DESTINATION	Q32,33	R118	C148,149	F
X14-178	O-10	K	NO	12K 500P
O-81	U,JE	2SC1740S(Q,R)	22K	50P

DESTINATION	Q48,51	Q52	R126	R129	C85	R130	D25,30
X07-222	O-10	K	2SC2003	NO	Jumper	NO	470µ 16
O-18	U,U	2SC1107	2SC2187	39	YES	330µ35	NO

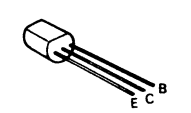
DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

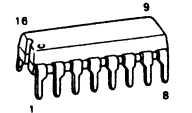
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

KVR-A90R(K)

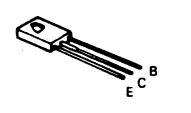
- 2SA733 (A)
- 2SA992
- 2SA999
- 2SC1845
- 2SC1923
- 2SC2003
- 2SC2320
- 2SC945 (A)



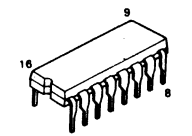
LA1232



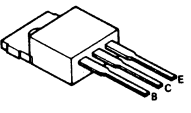
- 2SA1110
- 2SC2590



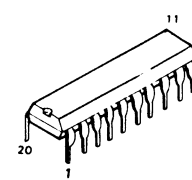
TC9176P



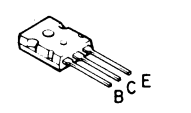
- 2SA957
- 2SC2167



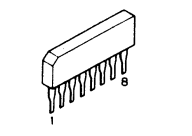
LA1245  
LA3390  
LM7000



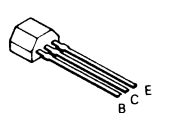
- 2SA1301\*5
- 2SC3280\*5



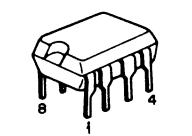
µPC1237H



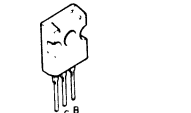
- 2SA933S
- 2SC1740S



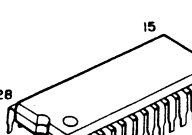
AN6556  
AN6556F



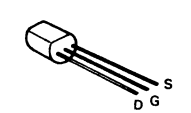
- 2SC3419



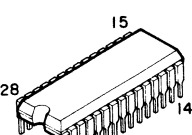
LC7522



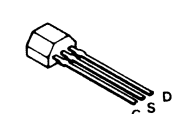
- 2SK163



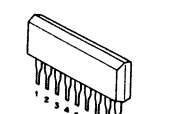
TC9164N



- 2SK161



- µPC1474HA

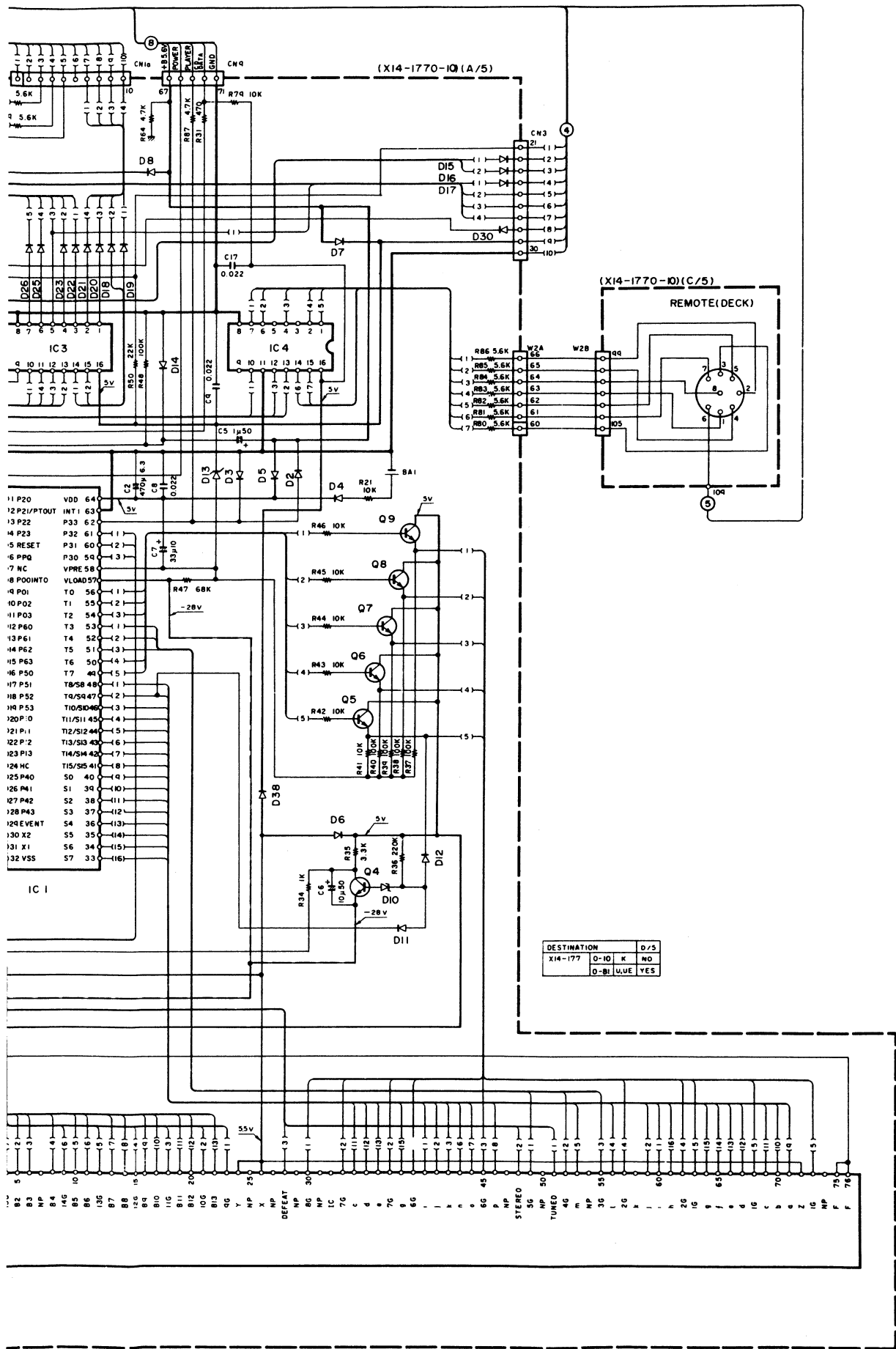


**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.





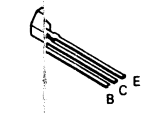




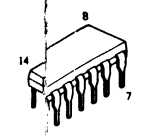
2SA733 (A)  
2SC1845  
2SC2003  
2SC2320  
2SC945 (A)



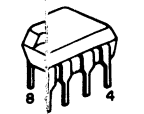
2SA933S  
2SC1740S



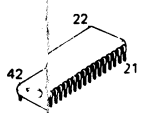
μPD4028BC  
μPD4066BC



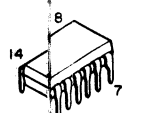
AN6556



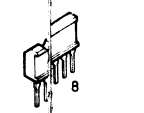
LC7565



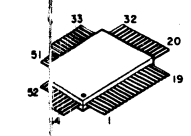
MB84028BM



BA7001



μPD7519G-172-36



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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C219,220 C221,222 C223,224 C225,226 C227,228			CF92FV1H473J CF92FV1H223J CF92FV1H822J CF92FV1H332J CF92FV1H184J	MF 0.047UF J MF 0.022UF J MF 8200PF J MF 3300PF J MF 0.18UF J		
C229,230 C231,232 C233,234 C235,236 C237,238			CF92FV1H104J CF92FV1H223J CF92FV1H103J CF92FV1H272J CF92FV1H122J	MF 0.10UF J MF 0.022UF J MF 0.010UF J MF 2700PF J MF 1200PF J		
C239,240 C241,242 C243,244 C245,246 C247			CK45FB1H471K CE04FW1H010M CE04FW1C100M CE04FW1C101M CK45FF1H473Z	CERAMIC 470PF K ELECTRO 1.0UF 50WV ELECTRO 10UF 16WV ELECTRO 100UF 16WV CERAMIC 0.047UF Z		
C301,302 C304 C305 C306 C307			CE04FW1HR47M CE04FW1HOR1M CF92FV1H473J CF92FV1H153J CF92FV1H682J	ELECTRO 0.47UF 50WV ELECTRO 0.1UF 50WV MF 0.047UF J MF 0.015UF J MF 6800PF J		
C308 C309 C310 C311 C312			CF92FV1H272J CF92FV1H102J CK45FB1H471K CE04FW1HOR1M CF92FV1H473J	MF 2700PF J MF 1000PF J CERAMIC 470PF K ELECTRO 0.1UF 50WV MF 0.047UF J		
C313 C314 C315 C316 C317			CF92FV1H153J CF92FV1H682J CF92FV1H272J CF92FV1H102J CK45FB1H471K	MF 0.015UF J MF 6800PF J MF 2700PF J MF 1000PF J CERAMIC 470PF K		
C318-324 TC1,2			CE04FW1H010M C05-0303-05	ELECTRO 1.0UF 50WV CERAMIC TRIMMER CAP. (20PF)		
82 86 87	2D 2D 2D,3D		E13-0621-05 E20-0452-05 E23-0125-05	PHONE JACK(6P) AUDIO INPUT SCREW TERMINAL BOARD(4P) ANT TERMINAL (GND)		
CF1,2 CF3 CF4 L1 L2		*	L72-0140-05 L72-0099-05 L72-0096-05 L40-2292-14 L39-0128-05	CERAMIC FILTER CERAMIC FILTER CERAMIC FILTER SMALL FIXED INDUCTOR(2.2UH,M) PEAKING COIL		
L4 L5 L6 L9 T1			L32-0277-15 L31-0509-05 L40-1021-14 L79-0154-05 L30-0403-05	MW OSCILLATING COIL MW-RF COIL SMALL FIXED INDUCTOR(1.0MH,K) LC FILTER FM IFT	KK	
T2 T3 X1			L30-0404-05 L30-0362-05 L77-0578-05	FM IFT AM IFT CRYSTAL RESONATOR(7.2MHZ)		
R68 -71 R101 R119 R151 R155			RD14AB2E100J RD14GB2E330J RD14AB2E330J RD14AB2E330J RD14AB2E330J	FL-PROOF RD 10 J 1/4W FL-PROOF RD 33 J 1/4W FL-PROOF RD 33 J 1/4W FL-PROOF RD 33 J 1/4W FL-PROOF RD 33 J 1/4W		

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Destination:

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A indicates safety critical components.

## PARTS LIST

\* New Parts

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R293,294 R342 VR1 VR2		*	RD14AB2E220J RS14DB3A271J R12-1070-05 R12-3096-05	FL-PROOF RD 22 J 1/4W FL-PROOF RS 270 J 1W TRIMMING PNT. (1K) VSP OFFSET TRIMMING PNT. (10K) VCO		
S1 S2	2C 2D		S42-2120-05 S31-2075-05	MULT. PUSH SW (EQ ON,EQ REC) SLIDE SWITCH (DE-EMPHASIS)	UUE	
D1 -28 D31 D32 -35 D36 D37			1SS133 KV1236(Z2) 1SS133 RD6.2E(B) 1SS133	DIODE VARIABLE CAPACITANCE DIODE DIODE ZENER DIODE DIODE		
D41 D42 D43 D44 D45 -51			1SS133 RD8.2E(B) 1SS133 RD6.2E(B) 1SS133	DIODE ZENER DIODE DIODE ZENER DIODE DIODE		
IC1 IC2 IC3 IC4 IC5		*	AN6556 TC9164N TC9176P AN6556F LA1232	IC(OP AMP X2) IC(16CH BILATERAL SELECTOR SW) IC(2CH ELECTRONIC VOLUME) IC(OP AMP X2) IC(FM IF/DETECTION)		
IC6 IC7 IC8 IC9 IC10		*	LA1245 LA3390 LM7000 AN6556 LC7522	IC(AM) IC(FM MPX) IC(PLL FREQUENCY SYNTHESIZER) IC(OP AMP X2) IC(7CH GRAPHIC EQUALIZER)		
IC11-14 Q1 -4 Q5 .6 Q7 Q7			AN6556 2SK163(L,M) 2SC945(A)(Q,P) 2SA733(A)(Q,P) 2SA933S(Q,R)	IC(OP AMP X2) FET TRANSISTOR TRANSISTOR TRANSISTOR		
Q21 Q24 Q24 Q26 .27 Q26 .27			2SC1923 2SC1740S(Q,R) 2SC945(A)(Q,P) 2SA733(A)(Q,P) 2SA933S(Q,R)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q28 .29 Q30 .31 Q32 .33 Q32 .33 Q41 -55			2SC1845(F,E) 2SC2003(L,K) 2SC1740S(Q,R) 2SC945(A)(Q,P) 2SC1740S(Q,R)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR	UUE UUE	
Q41 -55 Q56			2SC945(A)(Q,P) 2SC2003(L,K)	TRANSISTOR TRANSISTOR		
VIDEO CONTROL UNIT (X14-1790-10)						
C1 .2 C3 C4 C5 .6 C11		*	CE04FW1C330M CE04HW1C220M CE04DW1A471M CE04DW1A331M CK45FB1H561K	ELECTRO 33UF 16WV NP-ELEC 22UF 16WV ELECTRO 470UF 10WV ELECTRO 330UF 10WV CERAMIC 560PF K		
C12 C14 C15 C16 C17			CE04FW1H010M CF92FV1H123J CF92FV1H332J CF92FV1H123J CF92FV1H332J	ELECTRO 1.0UF 50WV MF 0.012UF J MF 3300PF J MF 0.012UF J MF 3300PF J		

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C18			CF92FV1H123J	MF 0.012UF J		
C19			CF92FV1H332J	MF 3300PF J		
C20			CE04FW1C100M	ELECTR0 10UF 16WV		
C21 ,22			CE04FW1H010M	ELECTR0 1.0UF 50WV		
C23 ,24			CE04FW1V4R7M	ELECTR0 4.7UF 35WV		
C25		*	CE04DW1C331M	ELECTR0 330UF 16WV		
C26 ,27			CE04FW1A470M	ELECTR0 47UF 10WV		
C28 ,29			CE04FW1C330M	ELECTR0 33UF 16WV		
C31			CE04FW1A470M	ELECTR0 47UF 10WV		
C32			CE04FW1C101M	ELECTR0 100UF 16WV		
C33			CE04FW1V4R7M	ELECTR0 4.7UF 35WV		
91	1D		E13-0227-05	PHONE JACK(2P) MONITOR OUT		
92	1D		E13-0625-05	PHONE JACK(6P) VIDEO		
R76			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
R86			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
R89			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
S1	1D	*	S31-2096-05	SLIDE SWITCH (MONO/STEREO)		
S2	2C	*	S42-2131-05	MULT. PUSH SW (VIDEO,SYNTH)		
S3	2C		S40-6027-05	PUSH SWITCH (MC/MM)		
D1 -8			1S5133	DIODE		
D1 -8			1S2076	DIODE		
D9			RD10E(B)	ZENER DIODE		
D10 ,11			RD8.2E(B)	ZENER DIODE		
IC1			BA7001	IC(SWITCHER FOR VCR)		
IC2 ,3			AN6556	IC(OP AMP X2)		
IC4			UPD4066BC	IC(BILATERAL SWITCH X4)		
Q1			2SC2320(E,F)	TRANSISTOR		
Q1			2SC945(A)(Q,P)	TRANSISTOR		
Q2			2SC2003(L,K)	TRANSISTOR		
Q3 ,4			2SC2320(E,F)	TRANSISTOR		
Q5 ,6			2SC1845(F,E)	TRANSISTOR		
Q7			2SC2320(E,F)	TRANSISTOR		
Q7			2SC945(A)(Q,P)	TRANSISTOR		
FRONT END UNIT (X86-1010-11)						
C1		*	C91-0716-05	CERAMIC 3.9PF K		
C2			CC45FSL1H470J	CERAMIC 47PF J		
C4			C91-0757-05	CERAMIC 0.001UF K		
C6 ,7		*	C91-0716-05	CERAMIC 3.9PF K		
C8		*	C91-0720-05	CERAMIC 8.2PF K		
C9			C91-0749-05	CERAMIC 220PF K		
C10 ,11			C91-0769-05	CERAMIC 0.01UF M		
C13			C91-0709-05	CERAMIC 1PF M		
C14		*	CC45FUJ1H080D	CERAMIC 8.0PF D		
C15		*	C91-0725-05	CERAMIC 15PF J		
C16			C91-0733-05	CERAMIC 33PF J		
C17			C91-0769-05	CERAMIC 0.01UF M		
C18		*	C91-0713-05	CERAMIC 2.2PF K		
C19			CE04FW1C470M	ELECTR0 47UF 16WV		
C20			CC45FSL1H470J	CERAMIC 47PF J		
TC1			C05-0302-05	CERAMIC TRIMMER CAPACITOR(11PF)		
L1			L31-0512-05	FM-RF COIL		
L2			L31-0513-05	FM-RF COIL		

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L3			L31-0515-05	FM-RF COIL		
L4			L31-0514-05	FM-RF COIL		
L6			L40-1092-14	SMALL FIXED INDUCTOR(1UH,M)		
L7		*	L30-0427-05	FM IFT		
L8		*	L32-0318-05	FM OSCILLATING COIL		
R16			RD14GB2E101J	FL-PROOF RD 100 J 1/4W		
D1 ,2			KV1310-3	VARIABLE CAPACITANCE DIODE		
D4			KV1310-3	VARIABLE CAPACITANCE DIODE		
Q1			2SK161(GR)	FET		
Q2			2SC1923(B)	TRANSISTOR		
Q4 ,5			2SC1923	TRANSISTOR		

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# SPECIFICATIONS

## Audio Section (IHF '66)

### Power Output

70 watts per channel minimum RMS, both channel driven at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.007% total harmonic distortion

80 watts per channel minimum RMS, both channel driven at 8 ohms from 40 Hz to 20,000 Hz with no more than 0.03% total harmonic distortion

80 watts per channel minimum RMS, both channel driven into 8 ohms at 1 kHz with no more than 0.007% total harmonic distortion

### Total Harmonic Distortion

(20 Hz - 20,000 Hz,

8 ohms) .....0.007% at 70 watts

(1 kHz, 8 ohms) .....0.002% at 70 watts

Inter Modulation Distortion .....0.007% at 70 watts

### Input Sensitivity/Impedance

PHONO (MM) .....2.5 mV/47 kohms

PHONO (MC) .....0.2 mV/100 ohms

CD/AUX, TAPE, VIDEO .....150 mV/47 kohms

### Frequency Response

PHONO (RIAA Standard

Curve) .....20 Hz - 20,000 Hz...

±0.5 dB

TAPE, CD/AUX .....10 Hz - 100,000 Hz...

+0, -3 dB

### Signal to Noise Ratio

PHONO (MM) .....85 dB

PHONO (MC) .....65 dB

CD/AUX, TAPE, VIDEO .....100 dB

### Graphic Equalizer

Center Frequency .....60 Hz, 150 Hz, 400 Hz,

1 kHz, 2.4 kHz, 6 kHz,

15 kHz

Control Range .....±12 dB

## Video Section

Inputs VIDEO 1, 2 .....1 Vp-p, 75 ohms unbalanced

### Outputs

VIDEO 1, 2 .....1 Vp-p, 75 ohms unbalanced

MONITOR VIDEO OUT .....1 Vp-p, 75 ohms unbalanced

## FM Tuner Section

Tuning Frequency Range .....87.5 MHz - 108 MHz

Antenna Impedance .....300 ohms balanced &

75 ohms unbalanced

Usable Sensitivity .....10.8 dBf (1.9  $\mu$ V)

### 50 dB Quieting Sensitivity

MONO .....14.2 dBf (2.8  $\mu$ V)

STEREO .....36.8 dBf (38  $\mu$ V)

### Signal to Noise Ratio at 65 dBf

MONO .....80 dB

STEREO .....72 dB

### Total Harmonic Distortion at 1,000 Hz

MONO .....0.07%

STEREO .....0.1%

Frequency Response .....30 Hz - 15,000 Hz +0.5,

-2 dB

Stereo Separation .....50 dB at 1,000 Hz

Selectivity .....55 dB at 400 kHz

Capture Ratio .....1.0 dB

Image Rejection Ratio .....38 dB

IF Rejection Ratio .....80 dB

Spurious Rejection Ratio .....75 dB

AM Suppression Ratio .....72 dB

## AM Tuner Section

### Tuning Range

530 kHz - 1,610 kHz (with the AM tuning interval set at 10 kHz)

531 kHz - 1,602 kHz (with the AM tuning interval set at 9 kHz)

Usable Sensitivity .....10  $\mu$ V (400  $\mu$ V/m)

Signal to Noise Ratio .....50 dB

Total Harmonic Distortion .....0.3%

Selectivity .....25 dB

## General

Power Requirement .....60 Hz, 120 V...USA Model

50/60 Hz, 110 - 120/

220 - 240 V...Others

Power Consumption .....3.2 A...USA Model/

250 W...Others

AC Outlet .....Switched x 3 (200W)

Dimensions (W x H x D) .....420 x 128.5 x 321 mm

16-9/16" x 5-1/6" x 12-5/8"

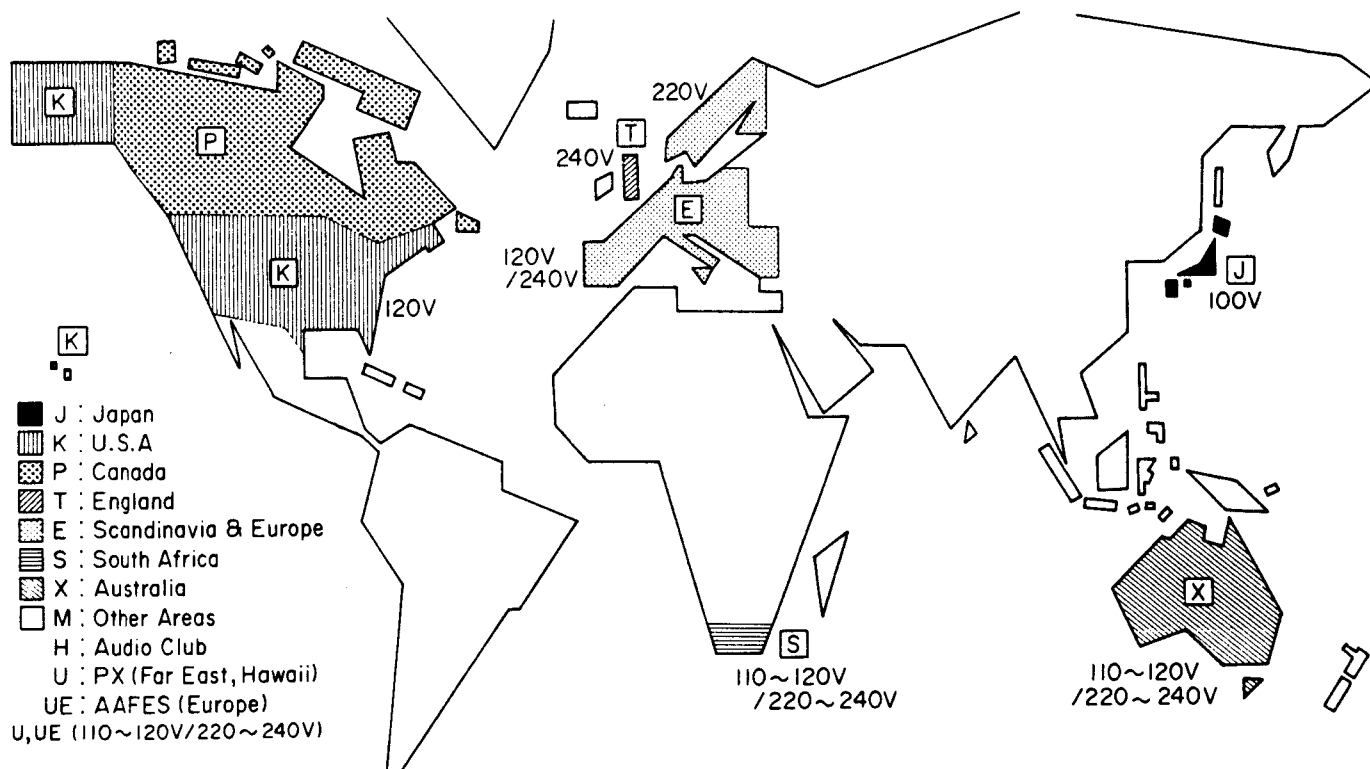
Weight .....Net 9.0 kg (19.8 lb)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

## WORLD MAP & AREA CODE



### Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

## TRIO-KENWOOD CORPORATION

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